

No. 2015-1767, -1768

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**United States Court of Appeals  
for the Federal Circuit**

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**TRADING TECHNOLOGIES INTERNATIONAL, INC.,**  
*Plaintiff-Appellant,*

v.

**SUNGARD DATA SYSTEMS, INC., SUNGARD INVESTMENT  
VENTURES LLC, GL TRADE AMERICAS, INC., SUNGARD FINANCIAL  
SYSTEMS (FRANCE) SAS, FKA GL TRADE SA, FUTUREPATH  
TRADING LLC,**  
*Defendants-Appellees.*

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Appeal from the United States District Court for the Northern  
District of Illinois in Nos. 1:05-cv-04120 and  
1:05-cv-05164, Judge Sara L. Ellis

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**OPENING BRIEF OF PLAINTIFF-APPELLANT  
TRADING TECHNOLOGIES INTERNATIONAL, INC.**

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Form 9

**FORM 9. Certificate of Interest****UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT**Trading Technologies Intl., Inc. v. Sungard Data Systems, Inc. et al.No. 2015-1767, -1768**CERTIFICATE OF INTEREST**

Counsel for the (petitioner) (appellant) (respondent) (appellee) (amicus) (name of party) plaintiff-appellant certifies the following (use "None" if applicable; use extra sheets if necessary):

1. The full name of every party or amicus represented by me is:

Trading Technologies International, Inc.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

See response to number 1.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None

4. ☒ The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

McDonnell Boehnen Hulbert & Berghoff LLP: Leif R. Sigmond, Jr., Paul H. Berghoff, Alan Wayne Krantz, Andrea Kay Orth, Ann C. Palma, Brandon J. Kennedy, Christopher D. Butts, Cole Bradley Richter, Christopher Michael Cavan, Dennis David Crouch, Jeffrey A. Steck, Jennifer M. Kurcz, Jeremy E. Noe, Kristen L. Thomson, Marcus Jay Thymian, Matthew J. Sampson, Michael David Gannon, Michelle Lynn McMullen-Tack, Paul A. Kafadar, Paul S. Tully, S. Richard Carden, Sarah Emily Fendrick, Lee, Sullivan, Shea, and Smith: George I. Lee, Rory P. Shea; Trading Technologies International, Inc.: Steven F. Borsand

September 4, 2015

Date

/s/ Cole B. Richter

Signature of counsel

Cole B. Richter

Printed name of counsel

Please Note: All questions must be answered

cc: \_\_\_\_\_

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## STATEMENT OF RELATED CASES

The patents-in-suit are U.S. Patent Nos. 6,722,132 (“the ‘132 patent”) and 6,766,304 (“the ‘304 patent”). These two patents have had an extensive litigation history.

In 2008, this Court heard an appeal involving the patents-in-suit in Case Nos. 2008-1392, -1393, and -1422 (“*eSpeed*”). *Trading Techs. Int’l, Inc. v. eSpeed, Inc.*, 595 F.3d 1340 (Fed. Cir. 2010) (Rader, Lourie and Clark) (“the *eSpeed* decision”). The parties agree that the construction of “static” from the *eSpeed* case is controlling here.

In 2011, this Court heard another appeal in the *eSpeed* case addressing issues unrelated to this appeal in Case No. 2011-1424. *Trading Technologies Intern., Inc. v. Espeed, Inc.*, 469 Fed. Appx. 914 (Fed. Cir. 2012) (unpublished) (Rader, Lourie and Wallach).

In 2013, this Court heard an appeal involving patents from the same family as the patents-in-suit that addressed issues unrelated to this appeal in Case No. 2012-1583. *Trading Technologies Intern., Inc. v. Open E Cry, LLC*, 728 F.3d 1309 (Fed. Cir. 2013) (Lourie, Plager and Benson).

In addition to the cases in the district court from which this appeal is taken, the following cases are also currently pending at the district court:

- Trading Technologies International, Inc. v. CQG, et al.*, (N.D. Ill. 05 C

4811) (district court currently considering post-trial motions after a jury verdict finding infringement of the same patents at issue here); and

- *Trading Technologies International, Inc. v. BGC, et al.*, (N.D. Ill. 10 C 715) (including assertion of infringement of the patents at issue here against the following defendants: TradeStation Securities, Inc., TradeStation Group, Inc., IBG, LLC, and Interactive Brokers, LLC).

## **JURISDICTIONAL STATEMENT**

The jurisdiction of the district court over this action arises under 28 U.S.C. §§ 1331 and 1338(a). On May 14, 2015, the district court entered final judgment of non-infringement in *Trading Technologies International, Inc. v. GL Consultants, Inc. et al.*, (N.D. Ill. 05 C 4120) (“the *GL* case”). On June 12, 2015, the district court entered final judgment of non-infringement in *Trading Technologies International Inc v. FuturePath Trading LLC*, (N.D. Ill. 05 C 5164) (“the *FuturePath* case”) pursuant to FED. R. CIV. P. 54(b). TT timely filed its notice of appeals for both cases on June 15, 2015. This Court has jurisdiction over these appeals pursuant to 28 U.S.C. § 1295(a)(1).

## STATEMENT OF THE ISSUES

1(a). Did the district court err in finding that for a product to literally meet the “static” claim limitation, any non-infringing (*i.e.*, non-static) mode in such a product must be capable of being completely disabled by a user (*e.g.*, with an on/off switch) such that the products can be operated “solely” in an infringing mode?

1(b). In particular, where the accused products here provide “static” modes in the form of fixed, predetermined time periods (that are known and adjustable by the user) during which the accused products operate in a manner that literally meets the controlling construction of “static,” did the district court err in granting summary judgment of no literal infringement based on its findings that the accused products (i) operate in a manner that does not meet the “static” limitation at predetermined moments in time that are known to the user and that only occur outside of the predetermined fixed time periods (“non-static moments”) and (ii) do not provide a user the ability to completely disable the non-static moments such that the products can operate “solely” in an infringing mode?

2. Did the district court err in barring TT from asserting that the accused products meet “static” under the doctrine of equivalents based on claim vitiation, where (i) the district court’s decision was based on a prior ruling in a different case (the *eSpeed* case) involving the same patents at issue here in which this Court



found claim vitiation based on a reason that does not apply to the accused products here, *i.e.*, that the eSpeed product ***never*** provided the benefit of the claimed invention (a guarantee of order accuracy) whereas the accused products here do and (ii) the difference between “static” and the accused products here is at most a “subtle difference of degree” and there are genuine issues of material fact with respect to underlying issues relating to equivalence?

## STATEMENT OF THE CASE

In 2005, TT sued GL Trade SA and GL Trade Americas, Inc. (collectively “GL Trade”) for infringement of the the patents-in-suit. A293-98. Later that year, TT also sued FuturePath Trading, LLC (“FuturePath”) for infringement of the patents-in-suit. A23190-94. In November 2008, SunGard Data Systems, Inc. purchased GL Trade, after which TT joined SunGard Data Systems, Inc. and SunGard Investment Ventures LLC to the suit. A836-41. In February 2011, TT amended its complaint, joining subsidiary SunGard Financial Systems (France) SAS (f/k/a GL Trade SA). A1521-30. The GL Trade and SunGard defendants are collectively referred to as “GL.”

Prior to filing suit against GL and FuturePath, TT sued eSpeed, among several other parties. The *GL* and *FuturePath* cases, along with *eSpeed* and several other cases involving the same patents-in-suit were all reassigned to Judge Moran only for purposes of common issues, including *Markman*. A1237.

Judge Moran conducted a joint *Markman* hearing in 2006. The court issued a *Markman* ruling (A757-81), which included a construction of the claim terms “static price axis” and “static display of prices”<sup>1</sup> (A762), and further elaborated on this construction in a clarification opinion. A783-92. Subsequently, in the *eSpeed*

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<sup>1</sup> Differences between these phrases are not relevant here, and thus, both of these phrases are referred to herein collectively as “static.”

case, Judge Moran granted summary judgment of non-infringement with respect to two of the accused products in that case, called Dual Dynamic and eSpeedometer.

A9397-419; *Trading Technologies Intern., Inc. v. eSpeed, Inc.*, 04 C 5312, 2007 WL 2484878, at \*1 (N.D. Ill. Aug. 27, 2007) *aff'd*, 595 F.3d 1340 (Fed. Cir. 2010).

In September and October 2007, a four-week jury trial was held in the *eSpeed* case on the remaining products at issue. On October 10, 2007, the jury rendered its verdict, finding infringement. A9421, A9423-28. TT appealed, among other things, the district court's construction of "static" and findings of non-infringement based on "static." eSpeed appealed various validity issues. This Court affirmed Judge Moran's construction of "static" in all respects, along with all of the other rulings made by Judge Moran. *Trading Techs.*, 595 F.3d at 1363.

After the conclusion of the *eSpeed* appeal, the *GL* and *FuturePath* cases were returned to the original Judges in each respective case. In July 2010, *GL* and *FuturePath* cases were consolidated.

GL and FuturePath moved for summary judgment of non-infringement based on their assertion that their products lacked the "static" limitation. A2233-34, A2794-95. The district court granted summary judgment of non-infringement on certain products in November 2014.<sup>2</sup> A1-25.

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<sup>2</sup> The district court also denied summary judgment of non-infringement on other products. A23-25.

Subsequently, the district court severed the *GL* and *FuturePath* cases.

A23184. In the *GL* case, the parties settled with respect to the products on which the district court denied summary judgment of non-infringement, the district court dismissed all claims relating to those products and entered final judgment on May 14, 2015. A23185-86. In the *FuturePath* case, the district court entered final judgment under FED. R. CIV. P. 54(b) on June 12, 2015. A24762.

On June 15, 2015, TT timely filed a notice of appeal in the *GL* case.

A23187-88. On the same day, TT timely filed a notice of appeal in the *FuturePath* case. A24764. Subsequently, this Court consolidated these appeals. Dkt. 2

## **STATEMENT OF FACTS**

### **I. BACKGROUND OF THE PATENTED TECHNOLOGY**

TT is the owner of the patents-in-suit. The specifications of the patents are, for all relevant purposes, identical. TT, an operating company with around 350 employees, successfully commercialized the patented invention in a product called MD TRADER® which was launched in August of 2000. A22981, A23013. MD TRADER remains an important product of TT today.

The patents are directed to innovative features of a graphical user interface (“GUI”) for the electronic trading of commodities. A26-72. An example embodiment includes “a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks.” A57 (col. 3, lines 11-16). The invention facilitates more accurate and efficient orders in this trading environment. A57 (col. 3, lines 5-24).

A prior-art style trading screen (GUI) is shown in Figure 2 of the patents-in-suit, reproduced below with highlighting added to show various features:

**FIG. 2**

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

Callouts and Annotations:

- Inside market**: Points to the top of the AskPrc column (204).
- Bid quantities**: Points to the BidQty column (202).
- Prices**: Points to the BidPrc (203) and AskPrc (204) columns.
- Ask quantities**: Points to the AskQty column (205).

A51. A trader can use this screen to trade a particular financial instrument (in this case, a CDHO contract). A58 (5:29-31). The prices for the contract are displayed in the two central columns 203 and 204. A58 (5:19-23). Bid and ask quantities associated with the prices are displayed in columns flanking the price columns. A58 (5:23-25). Bid and ask quantities represent orders in the market to buy or sell, respectively, at the level of the adjacent cell. A58 (5:36-42). The quantity and price information are received in a data feed from an electronic exchange that is continually updated as market data changes. A58 (5:25-28).

This prior art GUI displayed the best bid and ask prices (together, “the inside market”) in fixed, predetermined locations, such as the top cells in columns 203

and 204 shown above. The best bid price (7626 in Figure 2) is the highest price at which there is an offer to buy the contract. The best ask price (7627) is the lowest price at which there is an offer to sell the contract. In this Figure 2 style screen, the inside market is always displayed in the same fixed location (*i.e.*, the same cells in the top row). A58 (5:16-19).

In the *eSpeed* case, this Court accurately summarized how these Figure 2 style screens worked:

[r]eturning to the prior art, these displays had grids for the inside market that never changed. As the market fluctuated, however, the prices listed in those grids changed—oftentimes very rapidly. To buy at the inside market, a trader, for example, placed the mouse cursor on the grid for the inside market and clicked the mouse. Of course, as traders send bids and offers to the market, the price and quantity of the traded commodity changed. These changes altered the inside market.

*Trading Techs.*, 595 F.3d at 1345. One of the inventors, Mr. Brumfield, recognized a problem with the prior art style tools. *Id.* at 1345-46. He wanted to place orders at a particular price and would miss that price if the market changed at the moment he clicked on a cell to enter an order. *Id.* In such a case, the price would unexpectedly change under his pointer right at the moment he clicked and he could end up sending an order at an unintended price. *Id.*; A34-35 (col. 2, line 60 – col. 3, line 6), A56-57 (col. 2, line 55 – col. 3, line 4). Set forth below is an illustration of this problem:

**Placing a Buy Order for  
100 ZN DEC04 contracts at 111175**

Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
		80	111170	111175	345			
		1120	111165	111180	167			
		578	111160	111185	265			
		349	111155	111190	52			
		58	111150	111195	144			

**Time 1**

**Placing a Buy Order for  
100 ZN DEC04 contracts at ~~111175~~**

**Market jump causes order  
entry at wrong price -  
resulting in \$1,562.50 loss**

Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
		478	111175	111180	67			
		466	111170	111185	245			
		85	111165	111190	743			
		337	111160	111195	1044			
		164	111155	111200	73			



**Time 2**

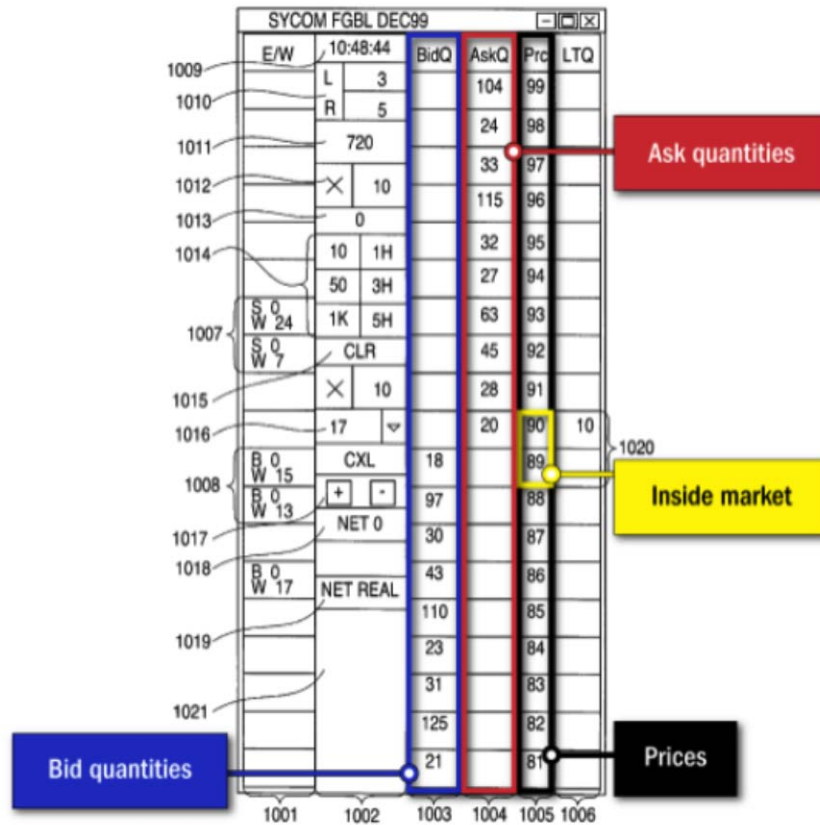
A21368. Because the intended price of 111175 unpredictably moved just before the trader clicked on it, he missed his intended price and instead sent an order at the higher price of 111180.

The claimed invention of the patents-in-suit addresses this problem with a



combination of elements, including “static” price levels. Figure 3 of the patents-in-suit is reproduced below with highlighting added to show relevant features:

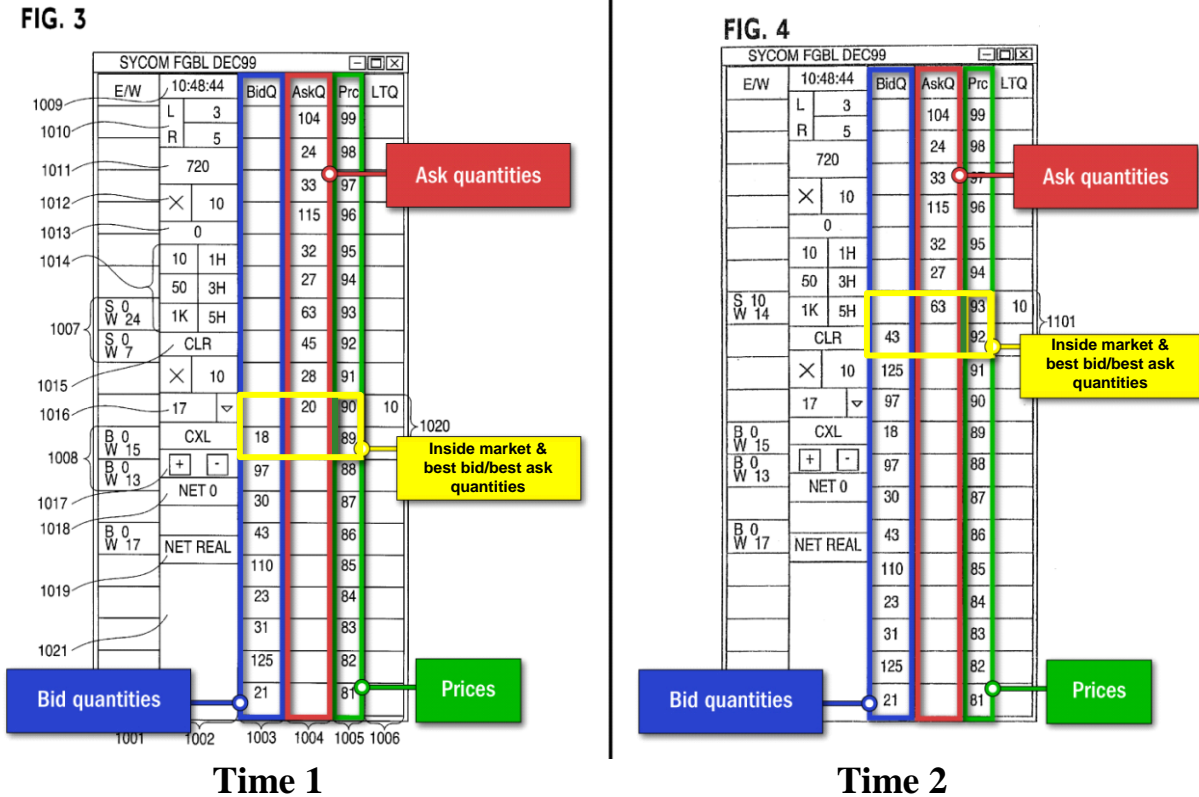
**FIG. 3**



The price levels for the contract are located in column 1005 labeled “Prc.” A59 (col. 7, lines 36-38). Column 1003 labeled “BidQ” and column 1004 labeled “AskQ” respectively show the bid and ask quantities for the associated price. A59 (col. 7 lines 35-36). The inside market labeled 1020 indicates the best bid price of 89 and the best ask price of 90. A59 (col. 7, lines 40-42). A trader may enter an order by clicking a bid or ask cell corresponding to a given price. A57 (col. 4, lines 9-19).

Figure 4 of the patents-in-suit displays the same market at a later time.

Figures 3 and 4 are shown below:



As shown in these figures, in response to market updates, the inside market indicators (*e.g.*, best bid and ask quantities) moved up such that the best bid price is now 92 and the best ask price is now 93. A59 (col. 8, lines 38-48). While the inside market changed, the values in the price column remained fixed. A59 (col. 8, lines 44-48). The claims of the patents-in-suit refer to these price levels as “static.” In this embodiment, over time, the inside market could shift to price levels not currently displayed. A59 (col. 8, lines 49-51). When this happens, to keep the inside market in view, the price levels must be re-positioned. A59 (col. 8, lines 49-

60). An embodiment of re-positioning is disclosed in the specification, which allows the user to re-center the price levels manually using a click of a mouse button. A59 (col. 8, lines 49-60).

In the *eSpeed* case, this Court accurately summarized some of the advantages of the embodiment described above (which includes static price levels) over the prior art:

[f]irst, a trader can visually follow the market movement as the inside market shifts up and down along the price column. *Id.* col. 5, ll. 58-65. Second, and perhaps most important, a trader has confidence in making an offer at the intended price. *Id.* col. 3, ll. 3-4. Because the invention has static price levels, the order entry region will remain associated with the same price. Therefore, the trader does not have to worry about “clicking on” or entering an order at the instant after a price change. Thus, the invention prevents accidental orders at an unintended price. The patents tout that these improvements ensure fast and accurate execution of trades. *Id.* col. 3, ll. 21-24.

*Trading Techs.*, 595 F.3d at 1347.

The present appeal centers on the term “static.”

## **II. IN *ESPEED*, “STATIC” WAS CONSTRUED TO REQUIRE THAT THE PRICE LEVELS CAN ONLY BE MOVED MANUALLY AND NOT AUTOMATICALLY**

In *eSpeed*, this Court affirmed Judge Moran’s construction that “static” means that the price levels do not move unless in response to a manual command (*i.e.*, the price levels cannot move “automatically”).<sup>3</sup> *Id.* at 1353-54. As stated by

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<sup>3</sup> In his initial *Markman* decision, Judge Moran construed “static display of

Judge Moran in a supplemental *Markman* opinion, this means that a “static condition--requires permanency” in that it permits only manual movement, not “automatic” movement. A790. This Court affirmed Judge Moran’s construction and left it unaltered. *Id.*, 595 F.3d at 1353.

The construction of “static” was based on Judge Moran’s view that the term requires the user not be faced with the problem discussed above of missing an intended price due to the price levels unexpectedly shifting at the time an order is attempted. A763-64. Sometimes herein, TT refers to this benefit as a “price guarantee.” As noted by this Court in affirming Judge Moran’s construction, “static” provides the user a guarantee of sending an order at the intended price because the price levels “cannot shift unexpectedly.” *Id.*, 595 F.3d at 1354-55. This avoids “the possibility of mistakes when the price column moved automatically at the same time a trader wished to make a purchase.” *Id.*

### **III. *ESPEED* ESTABLISHES THAT STATIC IS MET LITERALLY BY A PRODUCT WITH A MODE IN WHICH THERE IS NO POSSIBILITY OF AUTOMATIC MOVEMENT**

For literal infringement, “static” is met by a product that has at least one

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prices”/“static price axis” as comprising price levels “that do not change positions unless a manual re-centering command is received.” A762. Later, in a supplemental opinion, Judge Moran clarified that the construction is price levels that do not change positions “unless by manual re-centering or re-positioning,” clarifying that the construction permits any manual movement, not just a re-centering command. A790.

mode of operation in which the price levels cannot be moved automatically, *i.e.*, there is no possibility of “automatic” movement. Judge Moran found that a “static condition requires permanency,” meaning that there would be no possibility of automatic movement in a “static” mode. A790. In other words, to be a “static” mode, all automatic movement needs to be “disabled” while in that mode. In addition, so long as a product has a “static” mode, it will literally meet “static” even if the product also has a different mode in which automatic movement is possible. A9423, A9439-52, A9933-34.

In *eSpeed*, products were found to either infringe or not infringe based on whether they had a “static” mode.

**A. eSpeed’s Futures View Product Literally Met “Static” Because It Had A Mode With No Automatic Movement (Even Though It Also Had a Different Mode With Automatic Movement)**

For example, eSpeed’s Futures View product had a mode in which automatic movement was always possible. A9439-52, A9933-34. In particular, in this non-infringing mode, if the inside market changed to a price that was not shown on the trader’s screen (which could happen unexpectedly at any time), the price column would automatically re-center the inside market price in the display and all price levels in the price column would move. A9439-52, A9933-34, A23060. In this mode, the automatic re-centering feature was mandatory in the sense it was always possible and never disabled. *Trading Techs.*, 595 F.3d at 1355.

Accordingly, in this mode the user was not guaranteed of sending an order at his/her intended price because it was always possible the price levels could change unexpectedly at the moment the user clicks to send an order. *See* A9439-52, A9933-34, A763-64; *Trading Techs.*, 595 F.3d at 1354-55.

Despite this non-infringing mode, Futures View was found to infringe because it had another mode in which the price axis could only be moved manually. A9423, A9439-52, A9933-34. In this mode, there was no possibility of any automatic movement (*i.e.*, there was a “permanent state of lack of [automatic] movement” as set forth by Judge Moran). A9439-52, A9403. Accordingly, this mode was “static.” In this “static” mode, a trader would always get the benefit of the claimed invention (*i.e.*, the price guarantee). Thus, the presence of a non-static mode does not necessarily take a product outside the scope of “static.”

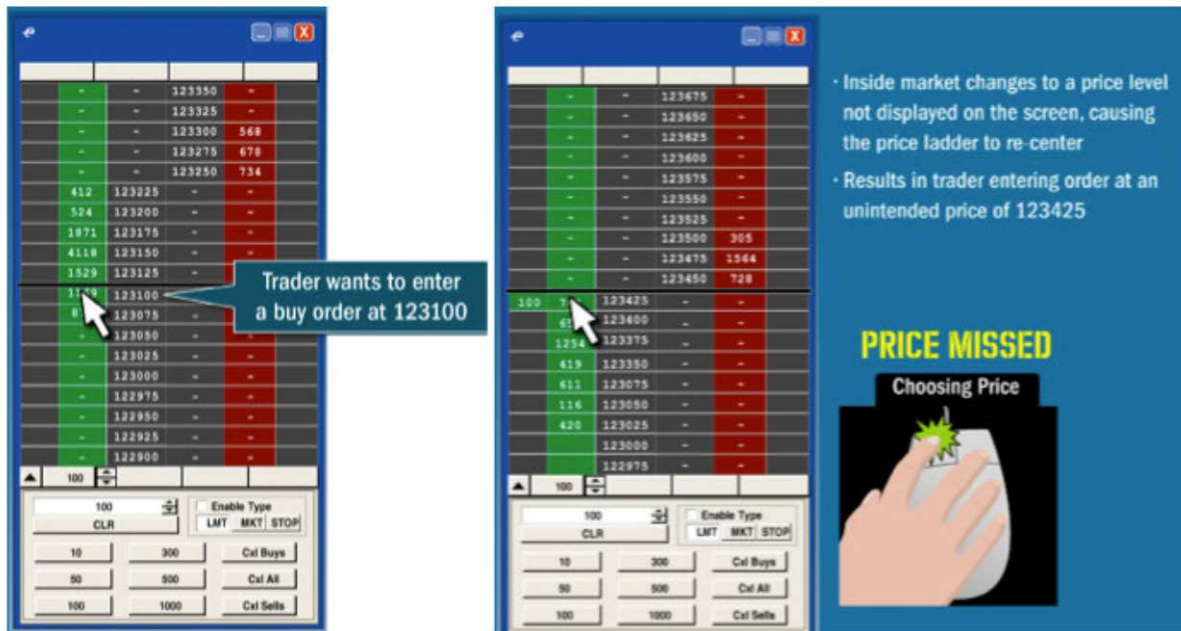
In Futures View, the user could switch back and forth between the static and non-static modes via a menu setting. A9934. As discussed below, the accused products here use a different means to switch back and forth between static and non-static modes. Importantly, as discussed below, this distinction is irrelevant here because neither the claim construction nor the law specify how a “static” mode needs to be entered/exited.

**B. eSpeed's Dual Dynamic and eSpeedometer Products Did Not Literally Meet "Static" Because They Lacked Any Mode In Which There Was No Possibility of Automatic Movement**

The other two products in the *eSpeed* case were found to not literally meet the "static" limitation because in those products there was *always* the possibility of automatic movement of the price levels due to the risk of a change in the inside market. A9400-04. There was no mode of operation that would eliminate that risk. A9410. For example, eSpeed's Dual Dynamic product operated at all times just like the non-infringing mode in the Futures View product. A9439-52, A23058-60, A9410. Namely, if the inside market changed to a price that was not displayed on the trader's screen, the price column would automatically re-center the inside market price causing all price levels in the price column to move. A9405. This automatic re-centering was unpredictable and could happen at any point in time because it was based on what was happening in the market – circumstances outside of the user's control. A9409-10. Importantly, this possibility of automatic re-centering could never be avoided in Dual Dynamic. A9409-10. As such, at all times, a trader using Dual Dynamic was *always* subject to the risk of an automatic re-centering event occurring. A9409.

This always-present possibility of automatic re-centering presented a constant risk that a trader would unexpectedly miss her intended price. *See Trading Techs.*, 595 F.3d at 1354. Thus, in Dual Dynamic, the trader never

received the benefit of the price guarantee. The problem of a trader missing his/her intended price in Dual Dynamic is illustrated in the graphics below, which show a screen shots of Dual Dynamic at two different times:



The above screenshots illustrate a trader attempting to enter an order at the moment when the inside market changes to a value not displayed on the screen (123425/123450), thus causing an automatic re-centering. Just at the moment the trader clicks to at the price of 123100, the price level in that cell unexpectedly changes to 123425. This results in the order being sent at an unintended price many price levels higher.

Unlike the infringing eSpeed Futures View product (discussed above), Dual Dynamic had no other mode of operation in which the price levels could only be moved manually. A9409. Accordingly, as noted by this Court, in Dual Dynamic,



the user “could not disable” the automatic re-centering and such automatic re-centering was “mandatory.” *Trading Techs.*, 595 F.3d at 1348, 1355. Thus, Dual Dynamic did not literally infringe, because it did not include a “static” mode in which there was no possibility of automatic movement. *See id.*; A9403-04.

Finally, eSpeed’s other product, “eSpeedometer,” similarly did not literally infringe because it also did not include a “static” mode. A9401-02, A9404. In particular, after every change in the inside market, eSpeedometer automatically caused the price axis to re-center by scrolling slowly toward the center of the screen, causing all price levels to move. A9401-02. Like Dual Dynamic, eSpeedometer’s automatic re-centering could never be disabled and could happen at any moment based on inside market changes. A9402. In short, eSpeedometer did not have a mode without automatic movement.

#### **IV. WITH RESPECT TO THE DOE, *ESPEED* ESTABLISHES THAT CLAIM VITIATION DOES NOT APPLY TO PRODUCTS THAT PROVIDE A PRICE GUARANTEE**

*eSpeed* provides guidance regarding how claim vitiation applies and does not apply with respect to the term “static.” In particular, the *eSpeed* decisions establish that claim vitiation applies to a product that fails to provide a price guarantee and that it does not apply to a product that does provide such a price guarantee. Both Dual Dynamic and eSpeedometer did not literally meet “static” because both products did not have a “static” mode. A9401-2, A9408-10. Judge

Moran found that claim vitiation barred the assertion of the DOE against the functionality of Dual Dynamic, which did not provide a price guarantee at any time. A9409-10. However, Judge Moran also found that TT's assertion of the DOE against eSpeedometer (which did provide a price guarantee) was *not* barred by claim vitiation.<sup>4</sup> A9410-11.

With respect to Dual Dynamic, although there was always a possibility of automatic movement, there were times when the product would behave such that the price levels did not move (with hindsight). *See* A9407-10. Based on this, TT asserted infringement under the DOE against Dual Dynamic. Judge Moran found that TT was barred from asserting infringement under the DOE against Dual Dynamic based on claim vitiation, because in Dual Dynamic the trader is always at risk of missing his/her price and thus the purpose of the claimed invention – to provide a price guarantee – would be frustrated. A9409-10. In Dual Dynamic, at all times the trader faced the problem that the price levels could unexpectedly shift, causing him/her to send an order at an unintended price. *See* , A9409-10. This Court affirmed these rulings relating to Dual Dynamic. *Trading Techs.*, 595 F.3d

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<sup>4</sup> TT notes that Judge Moran and this Court ultimately found that TT was barred by the doctrine of prosecution history estoppel (“PHE”) from asserting infringement under the DOE against eSpeedometer based on an amendment made during prosecution. However, this PHE ruling is not relevant to the issues in this appeal because, as the district court here properly found, the accused products are not within the scope of what was surrendered by the amendment. A24-25.

at 1356.

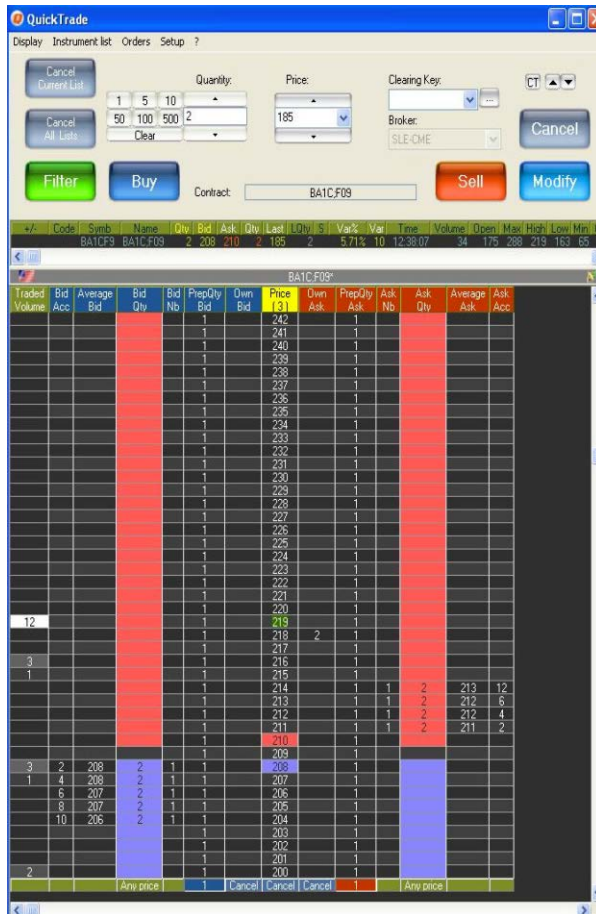
**V. THE ACCUSED PRODUCTS PROVIDE “STATIC” MODES IN WHICH THERE IS NO POSSIBILITY OF AUTOMATIC MOVEMENT AND WHICH PROVIDE A GUARANTEE THAT THE USER WILL SEND AN ORDER AT HIS/HER INTENDED PRICE**

**A. The Accused Products Provide “Static” Modes In The Form of Predetermined, Fixed Time Periods In Which The Price Levels Can Only Be Moved Manually**

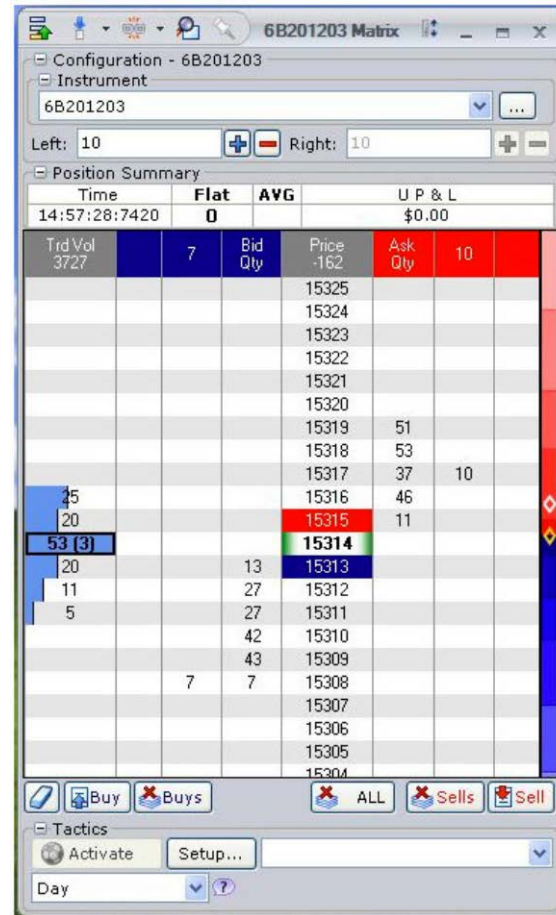
The accused products at issue here are order entry screens called “QuickTrade” in GL’s “GL WIN” software and “TradeMatrix” in FuturePath’s PhotonTrader2.<sup>5</sup> A1, A12 n. 3, A13 n.5. GL and FuturePath came onto the market with these products in competition with TT well after TT launched its commercial product embodying the invention in 2000. A23047. An example of a QuickTrade and TradeMatrix screen are set forth below side by side:

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<sup>5</sup> Many of the accused FuturePath products were made for FuturePath by GL.



QuickTrade

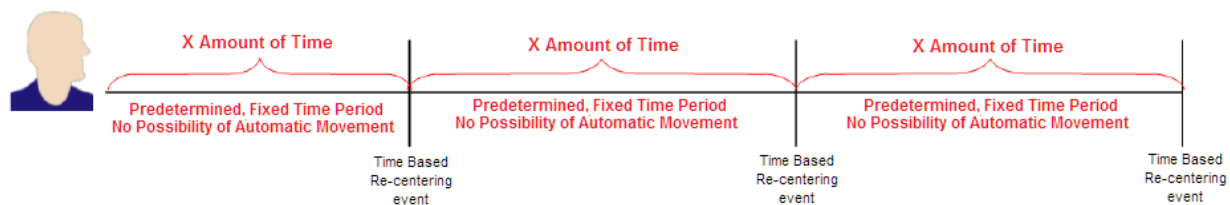


TradeMatrix

As shown above, the QuickTrade and TradeMatrix screens both include a vertical price axis (column in the middle labeled “Price”) flanked with a plurality of bids on the left and a plurality of asks on the right. A user can enter an order by clicking in the “Bid Qty” or “Ask Qty” columns. A9699-701.

The operation of the price axis in the accused products is not in dispute. There is only one form of movement of the price levels that Appellees allege to be “automatic” – which TT will refer to herein as a “Time Based Re-centering” event. A14144-45 n. 5. The Time Based Re-centering event causes the price axis to re-

center *only* when a predetermined, fixed time period expires. A9654. The Time Based Re-centering event is triggered by the software after the expiration of the pre-determined, fixed time period. A9654. The accused products permit the user to adjust the predetermined, fixed period (as described more below). A9654, A9749-50, A9661-62. Importantly, during the predetermined, fixed time period, the price levels will *never* move unless moved manually. A9654-58, A9698-703, A9660-64, A9543, A14144-45 n. 5. In operation, the accused products function as illustrated in the diagram below:



As shown in the above diagram, once the predetermined, fixed time period is set and the product is launched, the accused products follow a process that repeats itself. A9654. The process begins with the start of the predetermined, fixed time period as set by the user. A9654. When that fixed time period expires, the software invokes the Time Based Re-centering event causing the price levels to instantaneously re-center. A9654. After this moment, the process repeats itself. A9654. Each predetermined, fixed time period lasts for same amount of time.<sup>6</sup>

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<sup>6</sup> The accused products begin counting the beginning of the fixed time period when

A9654. The Time Based Re-centering events are predictable and do not occur unexpectedly. A9658-59, A9664. A user can choose not to click to send an order at the same time as a Time Based Re-centering event. A9658-59, A9664.

During each predetermined, fixed time period, the price levels will not move unless moved manually by the user and no “automatic” movement is possible.

A9654-58, A9698-703, A9660-64, A9543, A14144-45 n. 5. To be clear, Appellees do not dispute that the Time Based Re-centering event (the only movement in the accused products alleged to be “automatic”) cannot occur during the predetermined, fixed time periods. A14144-45 n. 5, A14230-31. Each predetermined, fixed time period provides a “permanent state of lack of [automatic] movement” because there is no possibility of automatic movement during such a period.<sup>7</sup> A9403, A9654-57. Accordingly, during the entirety of each predetermined, fixed time period the user is guaranteed of sending an order at his/her intended price. *See* A9346, A9654-57.

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the trading window is launched. Thus, if a user closes the accused product (e.g., the QuickTrade or TradeMatrix window) during a predetermined, fixed time period, the next time the window is launched the fixed time period will be reset.

<sup>7</sup> During the predetermined, fixed time period, the price levels will not automatically move even if the inside market changes to a price not displayed on the screen. A9654-57, A9704-54. In that instance, the screen will not display any quantities associated with the best bid or ask price. In other words, the market indicators move off the screen. In such a situation, the user needs to perform a manual command to bring the inside market prices back in view, such as a manual re-centering or scrolling command. A9654-57, A9704-54. This is exactly how eSpeed’s Futures View worked.

During each predetermined, fixed time period, the software is operating in an operational state distinct from the operational state of the software when the Time Based Re-centering event occurs. A9656, A9663. The fixed time period and the Time Based Re-centering cannot occur simultaneously. A9656, A9663. Accordingly, each predetermined, fixed time period is a “static” mode that provides the user with a price guarantee. Moreover, a user knows exactly how the price axis will behave at all times, including when the product is in a “static” mode. A9659; *see also* A9654, A9661.

**B. In All Versions of the Accused Products, the User Has The Ability To Set the Predetermined, Fixed Time Period Such That The Time Based Re-centering Event Will Never Occur**

A settings menu in QuickTrade permits the user to set the length of the predetermined, fixed time period by entering a number of seconds. A9654, A9657-58, A9762-75, A9825. For most versions of QuickTrade, the default fixed time period when the software is first launched is 15 minutes. A2249, A9303. The maximum number that can be entered in the QuickTrade settings menu varies from version to version and translates to the following time periods: approximately 24.8 days<sup>8</sup>, 2.78 hours (9,999 seconds), 16.65 minutes (999 seconds), or 15 minutes

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<sup>8</sup> Due to limitations in the design of these versions of QuickTrade, even though as user is permitted to enter a number up to 99,999,999 seconds (around 3.17 years), the product caps the maximum time period at around 24.8 days (around  $2^{31} - 1/1000$  seconds). A9657.

(900 seconds), depending on the version. A2561, A9657-58. In addition, for all versions of QuickTrade, users can edit a file (called QuickTr.ini) to set the fixed time period up to either approximately 49.7 days  $((2^{32}-1)/1000 \text{ seconds})$  or 24.8 days  $((2^{31}-1)/1000 \text{ seconds})$ , depending on the version. A9657-58, A9762-75. The evidence establishes that users typically set the fixed time period to the maximum setting. A9825, A9756-60, A9763-75(9767-69).

In versions 1.3.3.16-1.5.1.34 of TradeMatrix, the fixed time period was adjustable via the PhotonTrader 2 setting menus, with the largest time period being approximately 68 years  $(2^{31}-1 \text{ seconds})$ . A13, A9661. In subsequent versions, the fixed period of time is adjustable and can be set to 60 seconds using the setting menu. A9661. Even in these subsequent versions, the user can extend the fixed time period to sixty-eight years by modifying a configuration file using a text editor. A9661. In addition, TradeMatrix provides the user the ability to indefinitely extend this fixed time period by moving the mouse. A9661, A9829-35(9832-3). For example, if the trader sets the fixed period of time for sixty seconds, and after 45 seconds moves the mouse, the timer resets to 60 seconds. See A9661, A9829-35. Thus, the trader can stop the Time-Based Re-centering event from occurring altogether in TradeMatrix by simply moving his or her mouse. A9661.



For any versions of the accused products in which the predetermined, fixed time period is set to be longer than a typical trading day (*e.g.*, 7 hours), the Time Based Re-centering event will certainly never occur during a trading session, because the user will quit trading before the Time Based Re-centering event occurs. Moreover, in such a situation the Time Based Re-centering event will likely never occur at all due to the fact that users typically exit the trading screen (by closing the window) when it is not being used and Time Based Re-centering can only occur when the QuickTrade and TradeMatrix windows are actually running.

Indeed, in QuickTrade, if the user sets the fixed time period to the maximum using the .ini file, a Time Based Re-centering event will only occur if for more than 24 consecutive days (or more than 49 days for some versions), the user never restarts or logs off his computer and keeps the QuickTrade window continuously up and running and configured to view the same commodity. For TradeMatrix, if the user sets the fixed time period to the maximum, a Time Based Re-centering event will only occur if the user keeps the same computer for 68 years, if that computer continuously runs for all of those 68 years (*e.g.*, it was not shut down and there was never a power outage), and if the TradeMatrix window is continuously

up and running and configured to view the same commodity for 68 years (assuming that same commodity is still available for trading).<sup>9</sup>

**VI. THE ACCUSED PRODUCTS HERE ARE THE SAME AS ESPEED'S INFRINGING FUTURES VIEW PRODUCT IN ALL MATERIAL RESPECTS AND ARE DIFFERENT THAN ESPEED'S NON-INFRINGING DUAL DYNAMIC PRODUCT IN ALL MATERIAL RESPECTS**

Just like the eSpeed Futures View product described above, the accused products here all have a “static” mode in which the price levels can only be moved manually and thus provide a guarantee that the trader will send an order at his/her intended price. Also like Futures View, the accused products here all have another mode—when the Time Based Re-centering event occurs. Even assuming that the Time Based Re-centering event is “automatic” movement of the sort not permitted under the construction of “static,”<sup>10</sup> the presence of this additional mode does not change the fact that the accused products also have a “static” mode. The only difference between Futures View and the accused products is that in Futures View the user uses a menu setting to switch between modes whereas in the accused products the software switches the program from one mode to another. A9657.

TT's expert explained how this difference is irrelevant to the question of whether there is a “static” mode in the accused products. A9657. While the

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<sup>9</sup> Most futures commodities expire in less than three months.

<sup>10</sup> As set forth in the Argument section, TT submits there is at least a genuine issue of material fact on this point.

software in the accused products switches between the modes, this does not change the fact that the predetermined, fixed time period is a distinct operational state that provides a price guarantee. A9656, A9663. Moreover, neither the claim construction of “static” nor the law specifies how a mode must be entered or exited. *See* A757-81, A783-92.

The accused products are materially different than eSpeed’s Dual Dynamic product that was found not to infringe. The accused products provide predetermined, fixed time periods that give the user a price guarantee because there is no possibility of automatic movement. In Dual Dynamic, *at all times* there is a possibility of the price levels moving automatically (due to unpredictable inside market changes) thereby putting the trader *always* at risk of missing his/her intended price due to unexpected shifts of the price levels. Unlike the accused products here, Dual Dynamic *never* provides the user the benefit of the price guarantee.

**VII. THE DISTRICT COURT GRANTED SUMMARY JUDGMENT THAT “STATIC” IS NOT MET LITERALLY OR UNDER THE DOE, DESPITE THE FACT THAT THE ACCUSED PRODUCTS INCLUDE MODES WITHOUT AUTOMATIC MOVEMENT AND PROVIDE A PRICE GUARANTEE**

Even though the accused products provide a “static” mode, the district court granted summary judgment that “static” is not literally present in the accused products. A1-25. The district court reached this result by imposing a requirement

that the products be capable of operating “in solely an infringing mode” by providing the user the ability to use a setting to “elect to go from one mode to another.” A16, A19.

Even though the accused products provide a user with a guarantee that he/she will send an order at an intended price and do not present the problem of a user missing his/her intended price due to unexpected price movements, the district court granted summary judgment that TT is barred from asserting “static” is met under the DOE based on claim vitiation. A23. The district court based this ruling on its finding that users are at risk of missing an intended price “at the time” of the Time Based Re-centering event in the accused products. A23. The district court treated as irrelevant that a guarantee is provided during the predetermined, fixed time periods. A23. The district also treated as irrelevant the fact that the Time Based Re-centering events are completely avoidable by the user. A23

As explained below, both the district court’s literal and DOE rulings were in error and both should be reversed.

## SUMMARY OF THE ARGUMENT

The issue of infringement in this case centers on whether the accused products have a mode in which the price axis meets the “static” limitation. There is no dispute that the controlling construction of “static” is that the price levels do not move unless moved manually (*i.e.*, the price levels do not move automatically). To literally meet “static,” therefore, a product must have at least one mode in which the price levels can only be moved manually (*i.e.*, in which there is no possibility of automatic movement). Such a mode will provide the user a guarantee of sending an order at his/her intended price because the user is not at risk of clicking to send an order at the moment of an unexpected price movement.

Like the Futures View product found to infringe in *eSpeed*, the accused products here also clearly have a “static” mode in which there is no chance that the price axis will move except in response to a manual command from the user. These “static” modes in the accused products are in the form of repeating predetermined, fixed time periods, known to and adjustable by the user, in which the price levels can only be moved manually. The only alleged “automatic” movement occurs outside of these predetermined, fixed time periods. During these predetermined, fixed time periods, the accused products provide a guarantee that the user will send an order at his/her intended price – providing the user the full benefit of the claimed invention. In some cases, the accused products are capable of operating in

this infringing mode *for days or even years*. In fact, for any versions in which the time period may be set to be longer than a trading day, the result is that the software will *never* exit the infringing mode.

However, the district court erred by granting summary judgment of non-infringement because the accused products include what the district court found to be “automatic” movement that occurs at fixed time intervals outside of the predetermined, fixed time periods. The district court reached its ruling by improperly imposing an additional requirement that an infringing product must provide a user setting that permits a user to switch between modes and turn off any non-static modes so the product operates “in solely an infringing mode.” The district court found that the accused products do not meet this improper requirement because the software, not a user setting, is what causes the product to switch between modes. This was an error because such a requirement is not found in either the controlling claim construction or the law.

Part of the reason the district court reached this incorrect conclusion was its mistaken belief that TT is rearguing here an issue that it had already lost in the *eSpeed* case. For instance, the district court believed that under TT’s current argument, every product with automatic re-centering, such as the non-infringing Dual Dynamic product from the *eSpeed* case, would infringe. This is wrong. TT’s argument only applies to products like Futures View, that – despite having a mode

with automatic re-centering – also have an infringing mode in which there is no possibility of automatic movement. In Dual Dynamic, there was no “static” mode because the trader was always subject to a risk of automatic re-centering. Dual Dynamic *never* provided a user a guarantee of getting his/her intended price. Accordingly, the district court did not appreciate critical and material factual differences between the accused products here and the non-infringing Dual Dynamic product.

Furthermore, the district court erred in ruling that vitiation barred TT from asserting the DOE against the accused products. In particular, the district court again wrongly equated the non-infringing Dual Dynamic product in the *eSpeed* case with the accused products here, and erroneously concluded that because vitiation applied to Dual Dynamic, it must also apply to the accused products here. But the district court failed to appreciate the key functionality differences between the accused products and the Dual Dynamic product. Claim vitiation was found to apply to Dual Dynamic because it never provided the user a price guarantee. The accused products here do provide a price guarantee. Because a reasonable jury could have concluded that the price axes in the accused products are equivalent to “static,” the district court committed legal error in taking this fact question away from the jury.

Accordingly, the district court’s summary judgment rulings relating to both

literal infringement and infringement under the DOE should be reversed.



## ARGUMENT

### I. STANDARD OF REVIEW

This Court reviews a district court's grant of summary judgment *de novo*. *Carnegie Mellon Univ. v. Hoffman-La Roche Inc.*, 541 F.3d 1115, 1121 (Fed. Cir. 2008). Summary judgment is appropriate "if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." FED. R. CIV. P. 56(a). An issue of material fact is genuine "[i]f the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). The Court must view the alleged facts in the light most favorable to TT and draw all justifiable inferences in the TT's favor. *Novartis Corp. v. Ben Venue Laboratories, Inc.*, 271 F.3d 1043, 1046 (Fed. Cir. 2001).

Thus, when reviewing a district court's grant of summary judgment of non-infringement, this Court "must determine whether, after resolving reasonable factual inferences in favor of the patentee, the district court correctly concluded that no reasonable jury could find infringement." *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013). "Where the evidence is conflicting or credibility determinations are required, the judgment should be vacated . . . ." *Revolution Eyewear, Inc. v. Aspex Eyewear, Inc.*, 175 Fed. Appx. 350, 354 (Fed. Cir. 2006).

## II. THE DISTRICT COURT ERRED BY GRANTING SUMMARY JUDGMENT OF NO LITERAL INFRINGEMENT WHERE THE ACCUSED PRODUCTS EACH HAVE A “STATIC” MODE – A MODE IN WHICH THERE IS NO POSSIBILITY OF AUTOMATIC MOVEMENT

The accused products provide modes that literally meet “static” in the form of predetermined, fixed time periods known to and adjustable by the user in which the price levels can only be moved manually (*i.e.*, in which there is no possibility of automatic movement). A9654-58, A9344, A9698-703, A9660-64, A9543. The only alleged “automatic” movement occurs outside of these predetermined, fixed time periods. *See id.*, A14230-31. During these predetermined, fixed time periods, the accused products provide a guarantee that the user will send an order at his/her intended price -- providing the user the full benefit of the claimed invention. *See* A9698-703, A9654-57, A9704-54. The duration of the predetermined, fixed time period can be set by the user to as high as at least approximately *twenty-five days* in all versions of the accused GL products (and almost *fifty days* in some versions) and approximately *sixty-eight years* in all versions of the accused FuturePath products. A13, A9654, A9657-58, A9661, A9762-75, A9824-27. The flaw of the district court’s logic is illustrated by the preposterous result of finding that such products, in which any alleged “automatic” movement will never occur, do not literally meet “static.”

**A. The Law Provides That “Static” Is Met Literally By a Product That Includes A Mode In Which There Is No Possibility That The Price Levels Will Move Automatically, Regardless Of The Presence Of Other Non-Static Modes**

To infringe, an accused device “need only be capable of operating in the [infringing] mode . . . .” *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1309-10 (Fed. Cir. 2005). Put another way, “infringement is not avoided merely because a non-infringing mode of operation is possible.” *Z4 Technologies, Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1350 (Fed. Cir. 2007). Thus, a product with an infringing mode infringes. *Hilgraeve Corp. v. Symantec Corp.*, 265 F.3d 1336, 1343 (Fed. Cir. 2001).

The question of infringement—including whether a device is capable of infringing use—is a question of fact. *Reiker Enterprises, Inc. v. Fan Brace, Inc.*, 243 F.3d 557 (Fed. Cir. 2000) (unpublished) (internal quotations omitted); *Aspex Eyewear, Inc. v. Revolution Eyewear, Inc.*, CV99-1623LGB (BQRX), 2001 WL 34852697, at \*5 (C.D. Cal. June 4, 2001). Here too, the question of whether each accused product is capable of performing the claimed functions (namely, operating in an infringing mode) is a question of fact, which the district court improperly decided at the summary judgment stage. *See Reiker Enterprises, Inc.*, 243 F.3d at 557.

Here, the controlling construction of “static” requires that the price levels do not move unless moved manually. *Trading Techs.*, 595 F.3d at 1353-54.

Therefore, “static” is literally present in a product if the product includes a mode in which the price levels can only be moved manually. *See* A9338, A9396-419, A9423-28. Put another way, for “static” to be literally met, the accused product must have a mode in which there is no possibility of “automatic” movement of the price levels.

**B. The Accused Products Each Contain At Least One Mode In Which There Is No Possibility of Automatic Movement of the Price Levels**

As set forth above, a straightforward application of the controlling claim construction to the accused products shows that they literally meet the “static” limitation because the accused products have a mode that meets that limitation. In particular, there is no dispute that each of the accused products provides a repeating, predetermined fixed time period (which may be set by the user) in which the price levels of the price axis will not move unless moved manually (*i.e.*, in which there is no possibility of automatic movement). A12-13, A9654-58, A9698-703, A9845-48, A9660-64, A9543. TT’s expert, Mr. Klausner, further explained that these predetermined, fixed time periods constitute modes because they are distinct operational states. A9656, A9663. In this mode, there is a “permanent state of lack of [automatic] movement” because there is no possibility of automatic movement occurring and, thus the mode provides the trader with the benefit of the invention, a price guarantee. A786, A9403. Put another way, in this mode

“automatic” movement cannot occur and is therefore disabled. Accordingly, the “static” limitation is literally met by the accused products, just like eSpeed’s Futures View product.

The presence of the Time Based Re-centering event does not change the fact that the accused products also have a “static” mode. The Time Based Re-centering event is the only form of movement in the accused products alleged by Appellees to be “automatic” and precluded by the construction of “static.” A2762-5, A2768-69, A2807-12, A2815-17, A14144-45. Yet, it is undisputed that a Time Based Re-centering event cannot occur during the predetermined, fixed time periods.

A14144-45. Therefore, even accepting for argument’s sake that the Time Based Re-centering events are the sort of “automatic” movement not permitted by “static,”<sup>11</sup> the accused products literally meet “static” because they have an infringing mode. *See Cross Med. Prods.*, 424 F.3d at 1309-1310.

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<sup>11</sup> Mr. Klausner explained why Time Based Re-centering events should not be viewed as “automatic” in the sense of what is not permitted by the construction of “static.” A9658-59, A9664-65. This Court’s reasoning for finding certain movement to be automatic and not permitted was based on such movement causing prices to “shift unexpectedly.” *Trading Techs.*, 595 F.3d at 1355. In particular, the user is not faced with the problem of missing his/her price due to an unexpected movement at the moment of a Time Based Re-centering event. This is because the Time Based Re-centering events are 100% predictable and avoidable by the user. A user can choose to avoid clicking to enter an order at that time. A9658-59, A9664-65. Appellees did not materially dispute Mr. Klausner’s testimony. Accordingly, there is at least a genuine issue of material fact regarding whether Time Based Re-centering events are “automatic” and not permitted by “static,” and this provides an independent grounds for reversal.

Thus, there is no basis supporting the district court's grant of summary judgment of no literal infringement. At a bare minimum, there are genuine material issues of fact precluding such a finding of summary judgment.

Notably, this case presents the same issue that was present in a related case against a company called RCG involving the patents-in-suit. The accused RCG product ("Onyx") operated identically to the accused products here in all material respects. A9. In particular, Onyx included a price axis in which there was no possibility of automatic movement for a defined period of 30 seconds. A9. After the 30 second time period elapsed, the software caused the price axis to re-center. A9. In that case, Judge Dow denied RCG's motion for summary judgment of non-infringement in which RCG made the same arguments being made by Appellees here—that the presence of alleged "automatic" re-centering after the expiration of the 30 second time period took the product outside of the scope of the claims. A9; *Rosenthal Collins Group, LLC v. Trading Technologies Intern., Inc.*, 05-CV-4088, 2009 WL 3055381, at \*3 (N.D. Ill. Sept. 18, 2009). Judge Dow rejected these arguments, finding there were material issues of disputed fact precluding a finding of summary judgment. *Id.* at \*4. Based on the record here, at a minimum the district court should have done the same thing.

**C. The District Court Erred By Imposing a Requirement That The User Be Able To Operate The Accused Products “In Solely An Infringing Mode” By Using a Menu Setting To “Elect To Go From One Mode To Another” And To Completely Disable Non-Infringing Modes**

As set forth above, all that is required for “static” to be literally met is a determination that the accused product includes a mode that meets the construction (*i.e.*, a mode in which the price levels cannot move automatically). The district court actually established that this test is met – finding that the accused products include a price axis that “is static for a definable period of time” (A16) and that “the user can control [this] period of time . . .” (A16). These findings of fact are determinative in favor of TT, because they mean that under law the products have a mode that meets the construction.

The district court erred by improperly requiring more than this for literal infringement. In particular, the district court required that to literally meet “static,” the accused products must permit a user to operate such products “in solely an infringing mode” by providing the user with the ability to switch from one mode to another (*e.g.*, via a menu setting) and to completely turn off any mode with automatic movement. A16, A19-20. The district court found it important that in the accused products, the software causes the product to change modes and there is no such menu setting “that the user can elect to go from one mode to another.” A19. The district court emphasized that this is different than the eSpeed Futures

View product, where the infringing mode was accessed using a menu setting and “the user had the ability to decide to enable or disable this mode.” A19. As a result, the district court found that if a product has a mode without automatic movement and other modes that include automatic movement, such a product could only literally meet static if the product permits a user to completely turn off the modes with automatic movement. A16, A19-20.

The district court’s focus on whether the software or the user switches between modes is a red herring because *how* a product gets into and out of a mode is not the question – the relevant inquiry is *whether* such a mode exists. The controlling claim construction of “static” does not require that a static mode be entered or exited manually or that a product must operate “solely” in a “static” mode. Similarly, the law provides no such requirement. To the contrary, it is understood that products generally literally meet a limitation if they ever operate in an infringing mode.

The district court’s opinion reveals where it went wrong in reaching its flawed conclusion. The district court misapplied several statements from the decisions in the *eSpeed* case finding non-infringement of certain eSpeed products. In particular, the district court misapplied statements regarding “a permanent state of lack of movement” and “permanency,” “never,” that the “claim forbids all automatic re-centering” or that “any [automatic] movement takes a product []



outside the scope of [TT]'s claim.” A5, A6, A8, A16, A18, A22. Likewise, the district court misapplied statements from the *eSpeed* case addressing that automatic movement in eSpeed's non-infringing products could not be “disabled.” A12, A13, A15, A16, A19, A20.

These statements were not part of the construction of “static,” but were made in some of the opinions setting forth reasoning for the construction or the findings of non-infringement. Nonetheless, all of the statements, properly read, are entirely consistent with a finding that the accused products literally meet “static.”

As explained above, all of these statements from the *eSpeed* case are only relevant to the extent they describe a characteristic of a “static” mode. For example, for a product to literally meet “static,” it must have at least one *mode* that is “permanent,” “forbids all automatic re-centering,” and “never” has automatic movement. A786; *Trading Techs.*, 595 F.3d at 1353-56. In other words, for literal infringement there needs to be a mode in which there is no possibility of automatic movement. *Id.* Such a mode is “permanent” in the sense discussed in the *eSpeed* decisions. In such a mode, “automatic” movement is guaranteed to never occur. Similarly, if a product has a mode with no possibility of automatic movement, automatic movement is “disabled” in that mode. Likewise, the district court misapplied the use of the term “mandatory” in the *eSpeed* decisions. A6-8, A12-13. If a product has a mode with no possibility of automatic movement, automatic

movement is not “mandatory” in that mode.

The district court took a wrong turn by interpreting these statements as defining a characteristic of the entire product, as opposed to just a “static” mode. Statements regarding permanency, forbidding automatic movement, disabled, etc., do not impose a requirement that the accused products must permit a user to operate such products “in solely an infringing mode” by providing the user the ability to switch from one mode to another (*e.g.*, with a menu setting). These statements merely mean that there needs to be a mode with these characteristics in which automatic movement cannot occur.

As explained below, in the non-infringing eSpeed products, there was no “permanent state of lack of [automatic] movement” because there was no mode with no possibility of automatic movement—automatic movement was possible at all times in those products. In the non-infringing eSpeed products the possibility of automatic movement was *never* disabled and was *always* mandatory. A9408-10, A9412, A9419.

The district court’s misinterpretation of these statements is evident from many statements in the district court’s opinion. For example, the district court recognizes that the accused products have fixed time periods in which the alleged automatic movement cannot occur. A16, A19, A23. Yet, the district court still finds that automatic movement is not “disabled” in the accused products because it

can occur at other times. A12-13, A16, A20. This shows that the district court failed to appreciate that automatic re-centering is disabled in those fixed time periods and that is all that is required by “static.”

As another example, the district court noted that in FuturePath’s product, the time between Time Based Re-centering “can be extended by mouse movement, which resets the time.” A13. Yet, the district court then incorrectly concluded that “[m]ouse activity does not disable [Time Based] recentering.” A13. At another point, the district court acknowledged that there are periods in which the alleged Time Base Re-centering event cannot occur (“[a]lthough the user can control the period of time between automatic re-centering”), but then stated that such re-centering “cannot be *completely* disabled and thus it is inevitable that the price axis will move without user input.” A16 (emphasis added). Clearly, the district court is improperly adding an extra requirement that the product permits a user to disable automatic movement at *all* times, as opposed to merely requiring that automatic movement be disabled in a mode.

Notably, the district court contradicts itself when it describes functionality in the more recent QuickTrade versions for which it denied summary judgment under the DOE. In particular, the district court correctly found that in these versions the software can be operated to “disable the ability to enter an order for a period of 1 second before re-centering occurs.” A12. Here, the district court correctly

understands that if software stops something from occurring for a period of time (*e.g.*, the ability to enter an order), that functionality is disabled for that time. In such versions, the ability to enter an order is disabled for less than two seconds.

A9659. Both before and after that short time period, the user may enter an order.

*See* A9659. Likewise, the accused software prevents the Time Based Re-centering event from ever occurring during the pre-determined, fixed time periods. Thus, the district court's correct finding that order entry is "disabled" for a short period of time is in direct conflict with its finding that the Time Based Re-centering event is not disabled in the accused products.

The district court was also under the incorrect understanding that TT is arguing for the construction of "static" to be rewritten to require that "automatic" movement be "unpredictable." A18-19. This is not the case—TT is simply applying the construction as written. As explained above, the accused products all have modes in which the price axis can be only moved manually and in which there is no possibility of any alleged automatic movement, including Time Based Re-centering events, occurring. TT presented a separate, alternative argument that the Time Based Re-centering events in the accused products are not "automatic." But, the main argument presented to the district court assumed such events are "automatic."

**D. The District Court Erred In Finding That TT's Position Is Inconsistent With The *eSpeed* Ruling that Dual Dynamic Does Not Infringe**

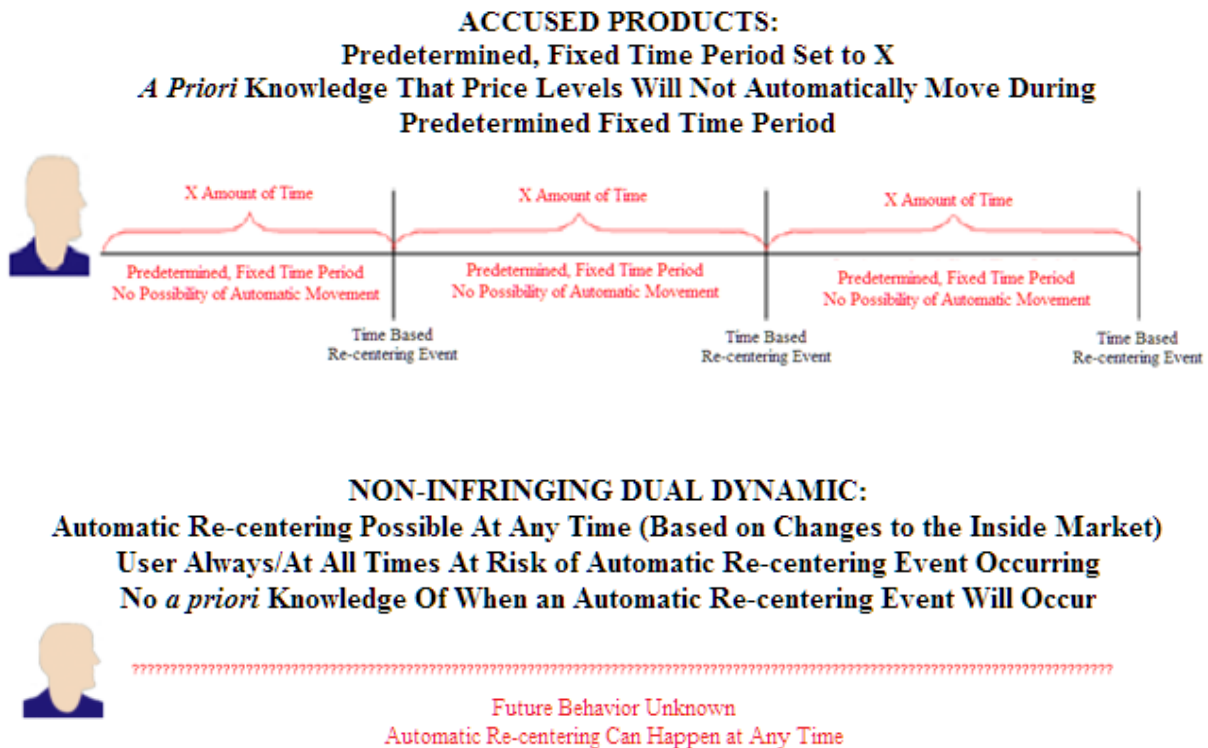
The district court incorrectly found that “[t]aken to its logical conclusion, TT’s proposed mode argument would render even products like Dual Dynamic infringing, despite TT’s acknowledgment that Dual Dynamic did not literally infringe the patents-in-suit.” A18. This makes clear that the district court did not appreciate the reasons why Dual Dynamic was found to not be “static” and the relevant differences between Dual Dynamic and the accused products. A correct understanding of the *eSpeed* decisions makes clear that “static” is literally present in the accused products and not literally present in Dual Dynamic. TT’s position here is entirely consistent with, and indeed mandated by, the *eSpeed* rulings with respect to Dual Dynamic.

While the accused products literally meet static for the reasons set forth above (*i.e.*, they have a mode in which no automatic movement is possible), the Dual Dynamic product is materially different and does not include any “static” mode. In particular, in Dual Dynamic there is ***never*** any time period or any set of conditions where the price levels can only be moved manually (*i.e.*, where there is no possibility of automatic movement). A9408-10; *Trading Techs.*, 595 F.3d at 1354-55. Rather, in Dual Dynamic, ***at all times*** there is a risk that the price levels will move automatically, thereby placing the user ***always*** at risk of missing

his/her intended price. *Id.* While it is true that when the Dual Dynamic product is operating there may be time periods in which it turns out in hindsight that the price levels did not move automatically, there is no time period whatsoever in which the user is guaranteed of such behavior. *See id.*, A9407-10. As such, Dual Dynamic **never** provided the benefit of the claimed invention.

The accused products, on the other hand, provide predetermined, fixed time periods known to the user where the user is guaranteed the price levels will not move automatically. *See* A9346, A9698-703, A9654-57, A9704-54. During these identifiable fixed time periods, the user is provided the full benefit of the claimed invention. The district court failed to appreciate this critical difference between Dual Dynamic and the accused products here.

The diagrams below illustrate this critical difference between the non-infringing Dual Dynamic product and the accused products here that have “static” modes:



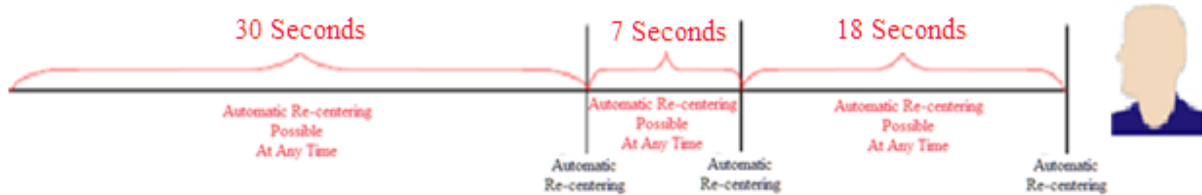
As shown above, in the accused products, the future behavior of the price axis is known—the trader knows that the price levels will not move during the predetermined, fixed time period unless the user manually instructs that they move. During that fixed time period, no alleged “automatic” movement, including the Time Based Re-centering event, is permitted to occur. In Dual Dynamic, on the other hand, the future behavior of the product is not known because automatic re-centering can happen at any time. As discussed above in Section III.B, in Dual

Dynamic the price levels automatically re-center if the current best bid or ask price changes to a price not displayed on the screen. This can occur at any time because the inside market price of a commodity at any given time is 100% outside of the user's control. When such an automatic re-centering event is triggered, all price levels in the price column of the Dual Dynamic product move. Thus, at all times, a user of Dual Dynamic is at risk of missing his/her intended price.

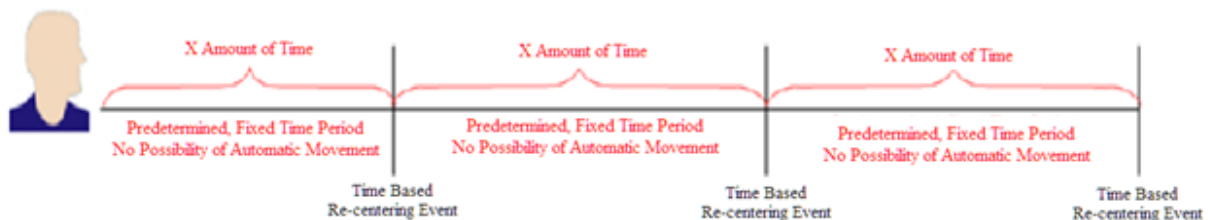
The district court improperly focused on the fact that there may be periods in which the price levels of Dual Dynamic do not move. A22. That is not determinative. Unlike the accused products here, whether and when an automatic re-centering event actually occurred in Dual Dynamic is only known after the fact. A user cannot know in advance the actual time(s) when an automatic re-centering event will occur. This is illustrated in the diagrams below:



**Example Historical Behavior of Non-Infringing Dual Dynamic:  
Actual Times of Automatic Re-centering Only Known After The Fact**



**ACCUSED PRODUCTS:  
Predetermined, Fixed Time Period Set to X  
A Priori Knowledge That Price Levels Will Not Automatically Move During  
Predetermined Fixed Time Period**



The above diagram for Dual Dynamic illustrates a hypothetical past behavior of the price axis. While it is true that there may be time periods when the price levels do not move, whether and when such time periods occur is never known in advance and is only known with hindsight. In the example of the diagram above, the user may know what happened in the past 55 seconds, but has no way of knowing whether and when the price levels will stay still or move automatically in any future period.

That there may be periods where the price axis is motionless between automatic repositioning events is not determinative as to whether such a product is

“static.” What is determinative is whether the product provides a mode (*e.g.*, a pre-determined, fixed time period) in which the trader is *guaranteed* that the price levels will not move automatically. Dual Dynamic was found not to infringe because, as shown above, it never provided such a mode. The accused products here, on the other hand, do provide for such a mode.

While the accused products are different than Dual Dynamic in all material respects, they are the same as eSpeed’s infringing Futures View product in all material respects. The district failed to appreciate the material similarities between the accused products and Futures View, instead focusing on immaterial differences. A19. The Futures View product was found to infringe because, even though it had automatic re-centering, it also had a mode in which there was no possibility of automatic movement. *See GL Trade Americas, Inc. v. Trading Technologies Intern., Inc.*, 11 C 1558, 2012 WL 205909, at \*1 (N.D. Ill. Jan. 23, 2012), *as corrected* (Feb. 13, 2012). Likewise, the accused products also have a “static” mode notwithstanding the presence of Time-Based Re-centering. During the entire predetermined, fixed time period, the accused products operate identically to the infringing mode in the eSpeed Futures View product and the trader is guaranteed of entering an order at his/her intended price. Just like the infringing mode in Futures View, during the predetermined, fixed time period in the accused products, the bids and asks move up and down relative to the price axis

and will move out of view if the inside market changes to a non-displayed price. In such an instance, just as in the static mode of Futures View, the user needs to perform a manual command to bring the market back into view.

**E. The District Court Erred By Concluding That TT's Infringement Arguments Here Were Rejected In *eSpeed***

The district court based its opinion at least in part on the mistaken belief that Judge Moran previously decided that products having Time-based Re-centering do not literally meet the “static” limitation. A16-17. The *eSpeed* case made no such decision, nor could have made such an infringement assessment because none of the *eSpeed* products at issue had time based re-centering. Indeed, as explained above, the *eSpeed* decisions reached a claim construction that does cover the accused products with Time Based Re-centering. Thus, the district court is wrong in its conclusion that *eSpeed* found Time Based Re-centering to not infringe.

At the time of the *Markman* rulings, TT was seeking a construction of “static” that would have literally covered a product that provided any period of time in which the price levels do not move, even if they were always subject to a possibility of automatic movement during such time periods. A15133-34. In other words, TT was seeking a construction that did not require a price guarantee and that proposed construction would have literally read on Dual Dynamic. TT's construction was rejected by both Judge Moran and this Court. A757-81; *Trading Techs.*, 595 F.3d at 1353-54. In rejecting TT's construction, Judge Moran

emphasized that he believed “static” required a guarantee. A763-64. The result was the controlling construction – which as explained above covers products with a mode in which there is no possibility of automatic movement and does not cover products like Dual Dynamic.

The several out-of-context statements cited by the district court (A16-17) do not support its conclusion and, in any event, are *dicta*. These statements were made in the context of rejecting TT’s proposed construction at the time – a construction that did not require a price guarantee. Judge Moran expressed that if he were to accept TT’s previously proposed construction (which would cover a price axis when automatic movement was possible), he would not have known where to draw the line. A763. The particular questions listed in the quote cited by the district court came from eSpeed, not TT, and were designed to make it appear that TT was taking inconsistent positions. TT later made clear to the court that it was not taking such inconsistent positions.

What is important here today is the ultimate construction reached by Judge Moran and affirmed by this Court. TT is asserting infringement based on this controlling construction, not its previously proposed construction which was rejected. As set forth above, the controlling construction of “static” requires no automatic movement and any product with a mode where there is no possibility of automatic movement literally meets “static.” Also, as set forth above, the accused

products clearly literally meet the controlling construction while the Dual Dynamic product does not.

In addition, the district court incorrectly concluded that TT's arguments are the same "part-time" infringement arguments that were previously rejected by Judge Moran. A16-17, A19. When Judge Moran rejected TT's "part-time" infringement arguments in the second *Markman* ruling, he was not ruling that a product with time based re-centering did not infringe. *See* A786-87, A790-91. When TT was attempting to have the construction of "static" clarified or reconsidered to read on a product without a guarantee, TT's argument relied on the law of part-time infringement. A14937-46. In particular, TT argued that even though a trader was always at risk of missing his or her price due to the constant risk of an automatic re-centering event, a product like Dual Dynamic infringes "part-time" (when the product is not automatically re-centering) and does not infringe at other points in time (when the product is automatically re-centering). A14938-41.

Judge Moran rejected TT's arguments because he ultimately construed "static" to require no possibility of automatic movement. A790. Under this construction, there was no part-time infringement by Dual Dynamic because that product always presented a possibility of automatic movement. A9408-10, A9412, A9419. TT is not rearguing this here – rather TT is only asserting literal

infringement against products that have a mode with no possibility of automatic movement. TT is *not* arguing that products that do not provide a price guarantee (like Dual Dynamic) literally meet the “static” limitation.

Notably, Judge Dow in the related *RCG* case properly recognized that TT’s assertion of infringement against a product with different modes, one that meets static and one that does not, is not the “part-time” infringement argument that Judge Moran rejected at *Markman*. *Rosenthal Collins Group*, 2009 WL 3055381, at \*3. Judge Dow correctly found that Judge Moran’s *Markman* ruling merely noted that “static” is not literally met “part-time” by a product like Dual Dynamic where the price levels may not move at times, but are always subject to a risk of automatic movement. *Id.* Just like in this case, TT was asserting that RCG’s Onyx product met “static” because it included a price axis in which there was no possibility of automatic movement for a predetermined, fixed time period of 30 seconds. *Id.* at \*3. Judge Dow properly concluded that TT’s assertion against RCG’s product was not inconsistent with the argument that it had previously lost. *Id.* The district court here should have reached the same conclusion.

**F. Even Applying The District Court’s Incorrect Test For Determining Infringement, Summary Judgment Should Have Been Denied For Additional and Independent Reasons**

Notwithstanding the mistakes in the district court’s opinion set forth above, the district court even erred under its own logic when it all but ignored the

capability in *all* of the accused products for a user to extend the Time Based Re-Centering Event to be longer than a trading day, disabling Time Based Re-Centering from ever occurring. On this independent ground alone, the district court’s grant of summary judgment of non-infringement must be reversed.

The district court’s opinion incorrectly asserts that “QuickTrade’s re-centering function is mandatory; it cannot be disabled by the user.” A12.

Likewise, the district court erroneously found the same was true for TradeMatrix.

A13. Because both findings of fact were in error even under the district court’s flawed logic, the district court’s opinion must be reversed.

First, as set forth by both parties’ experts, users of the following versions of Quicktrade and TradeMatrix software could extend the re-centering frequency of the Time Based Re-centering event beyond a trading day merely by adjusting the software’s menu setting for centering frequency:

<b>Product/Versions</b>	<b>“Settings” Dialog Box Centering Frequency Maximum</b>
QuickTrade 8.1.6.12, 8.1.7.14, 8.1.7.18, 8.1.7.24, 8.1.9.6, 9.1.1.9, 9.1.1.31, 9.1.2.17, 9.1.3.11, 9.1.4.7, 10.0.23.32, and 10.0.23.66	99,999,999 seconds (3.17 years—however software only processes this to 24.8 days) (A2560-61, A9657)
TradeMatrix 1.3.3.16-1.5.0.8	68 years (A9661); 999,999 seconds (11.57 days) (A3152)

Moreover, GL's own release note states that the purpose of extending the centering frequency was because "some users did not want to have the auto-centering refreshed several times per day." A9823-27.

If the predetermined, fixed time period is set to a time period longer than a trading day, the Time Based Re-centering event will never occur. This is because the predetermined, fixed time period resets every time a trader logs in and reopens the software at the beginning of the day in such versions. Thus, the Time Based Recentering event may be disabled in these versions quite easily. The district court's opinion does not address this functionality, which even under its flawed logic, is infringing.<sup>12</sup>

Second, *all versions* of both GL's Quicktrade and FuturePath's TradeMatrix products also provide a settings file (QuickTr.ini and user.config, respectively) that a user can modify with a text editor to extend the Time Based Re-Centering frequency up to at least 24.8 days or 49.7 days for Quicktrade and up to 68 years for TradeMatrix, as detailed below:

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<sup>12</sup> In addition, it is preposterous to believe that if the predetermined fixed time period were set to the maximum value in these versions (over 24 or 49 days in Quicktrade and 68 years in TradeMatrix), that the computer would ever be up and running that long, with the same window open, connected to the same market. Further, both GL and FuturePath update software versions much more frequently than this and it would also be preposterous to believe that a trader would be using the same computer years from now. *See* A2585-88.



<b>Product/Versions</b>	<b>Configuration File Recentering Max</b>
QuickTrade/5.9.0-5.13.5	24.8 days (A9657)
QuickTrade/7.1.1-8.1.5.10	24.8 days (A9657)
QuickTrade/8.1.6.12, 8.1.7.14, 8.1.7.18, 8.1.7.24, 8.1.9.6, 9.1.1.9, 9.1.1.31, 9.1.2.17, 9.1.3.11, 9.1.4.7, 10.0.23.32, and 10.0.23.66	24.8 days (A9657)
QuickTrade/8.1.10.15-9.1.0.121 and 9.1.5.4-9.1.21.77	49.7 days (only for 8.1.11.87, 9.1.0.121, 9.1.12.5-9.1.21.77), 24.8 days for remainder of range (A9658)
TradeMatrix/1.3.3.16-1.5.0.8	68 years (A9661)
TradeMatrix/1.5.0.85+	68 years (A9661)

Finally, the district court failed to explain how its finding of non-infringement could possibly apply to any version of TradeMatrix, in which the user always has the ability to indefinitely extend the predetermined, fixed time period by moving the mouse (and thus disable Time Based Recentering). A9661-61, A9665. The district court simply dismissed this functionality, noting that while “the time between re-centering can be extended by mouse movement, which resets the timer. Mouse activity does not disable re-centering, however.” A13. Yet the district court improperly decided a genuine issue of material fact about whether, even under the district court’s logic, that software capable of indefinitely extending the re-centering event (even if “automatic”) infringes because a user may disable such re-centering from ever occurring. Indeed, in TradeMatrix, even if the trader

were to retain the default fixed period of time of sixty seconds, this timer resets every single time the trader moves the mouse. A9661-61, A9665. Thus, the trader can also disable the Time-Based Re-centering event in TradeMatrix by simply moving his or her mouse. A9661-61, A9665.

For these independent reasons, the district court's opinion must be reversed.

### **III. THE DISTRICT COURT ERRED IN RULING THAT VITIATION BARRED TT FROM ASSERTING THE DOE AGAINST THE ACCUSED PRODUCTS**

The district court erred in finding that claim vitiation barred TT from asserting the DOE against the accused products by ignoring material facts that show there is no vitiation. Also, the district court once again wrongly equated the non-infringing Dual Dynamic product in the *eSpeed* case with the accused products here, and erroneously concluded that because vitiation applied to Dual Dynamic, it must also apply to the accused products here. Because a reasonable jury could have concluded that the price axes in the accused products are equivalent to "static," the district court erred in taking this fact question away from the jury.

#### **A. Claim Vitiation Law**

Like summary judgment, the issue of claim vitiation under the DOE is reviewed *de novo*. *Cordis Corp. v. Boston Sci. Corp.*, 561 F.3d 1319, 1330 (Fed. Cir. 2009) (citing *Pfizer, Inc. v. Teva Pharms. USA, Inc.*, 429 F.3d 1364, 1379 (Fed.Cir.2005)). Vitiation cannot apply when there is a "subtle difference in

degree” between the claim element and the accused product; it only applies when there is a “clear, substantial difference or a difference in kind.” *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1360 (Fed. Cir. 2005). Claim vitiation should only be applied if “the evidence is such that no reasonable jury could conclude that an element of an accused device is equivalent to an element called for in the claim.” *Voda v. Cordis Corp.*, 536 F.3d 1311, 1325 n.5 (Fed. Cir. 2008). If there are genuine issues of material fact with respect to underlying issues relating to equivalence, then there is no claim vitiation. *See Deere and Co. v. Bush Hog LLC*, 703 F.3d 1349, 1356 (Fed. Cir. 2012).

Indeed, “[v]itiation’ is not an exception to the DOE, but instead a legal determination that ‘the evidence is such that no reasonable jury could determine two elements to be equivalent.’” *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n. 8 (1997). “Courts should be cautious not to shortcut this inquiry by identifying a ‘binary’ choice in which an element is either present or ‘not present.’” *Deere and Co.*, 703 F.3d at 1356 (vacating lower court’s summary judgment ruling that product with no “direct contact” between two walls vitiated a claim requiring “direct contact” because a reasonable jury could find that a small spacer between the walls represented an insubstantial difference). Instead, “preserving the doctrine in its proper narrowed context requires a court to examine the fundamental question of whether there is a genuine factual issue that the

accused device, while literally omitting a claim element, nonetheless incorporates an equivalent structure.” *Id.* The district court failed to do so here.

**B. The District Court Erred By Ignoring That The Accused Products Provide A Price Guarantee**

The district court hinged its opinion on its finding that the benefit of the claimed invention is defeated “at the time” of a Time Based Re-centering event.

A23. The district court’s DOE ruling is incorrect for two independent reasons.

First, this finding, even if true, is not dispositive. Second, the finding is incorrect.

First, even if the benefit of the claimed invention is defeated at the moment of a Time Based Re-centering event (which TT disputes), the district court still erred. The district court ignored that the accused products have predetermined, fixed time periods in which the user is provided a guarantee of sending orders at his/her intended price. *See* A9346, A9698-703, A9654-57, A9704-54. This fact alone establishes that claim vitiation does not apply here because, as set forth in the *eSpeed* decisions, claim vitiation applies when a product does not provide a price guarantee. The difference between a product with fixed time periods that provide a guarantee and the term “static” is a “subtle difference in degree” as opposed to a “clear, substantial difference or a difference in kind.” *Freedman Seating Co*, 420 F.3d at 1360 (Fed. Cir. 2005). Products with such fixed time periods provide the benefit of the claimed invention during such time periods, and, therefore, do not defeat that claimed advantage.

Second, the benefit of the claimed invention is not ever defeated in the accused products, including at the moment of a Time Based Re-centering event. *See* A9654-57, A9704-54. In particular, the district court ignored the fact that the Time Based Re-centering events in the accused products are 100% predictable and avoidable by the user. This fact alone establishes that claim vitiation does not apply here because, as set forth in the *eSpeed* decisions, claim vitiation applies to a product that defeats the benefit of a user not missing an intended price due to ***unexpected*** movement of the price levels. *Trading Techs.*, 595 F.3d at 1356. The various *eSpeed* decisions made clear that the reason why “automatic” movement was excluded by the construction of “static” was because such movement could cause the price levels to “shift unexpectedly.” *Id.* at 1355. This then creates a risk that the trader could unwittingly miss his/her intended price. Even if Appellees are correct that time based re-centering is technically “automatic” and thereby causes a product with such movement to be outside the literal scope of “static,” TT should still be able to argue that such re-centering does not preclude a finding of infringement under the DOE.

TT submitted evidence showing that Time Based Re-centering events are not outside of the user’s control and are not unpredictable (*e.g.*, based on changes in the inside market). A9658-59, A9664. Time Based Re-centering events do not create the problem of a user missing his/her intended price due to unexpected

movement, because such events are predictable and avoidable. As explained by Mr. Klausner, the trader can choose to not click to send an order at the same time as a Time Based Re-centering event, just like a user can chose to not click to send an order at the same time that he/she causes the prices to move in response to a user command (*e.g.*, pressing a key). A9658-59, A9664. Mr. Klausner explained why such Time Based Re-centering commands do not interfere with the benefit of the claimed invention. A9658-59, A9664. In the accused products, at all times (both during the pre-determined fixed time periods and at the moment of a Time Based Re-centering event), the user is not a risk of missing his intended price due to unexpected movement. Appellees never submitted evidence contradicting Mr. Klausner's opinion and explanation. Accordingly, at a minimum, there is a genuine issue of fact regarding whether the price axes with Time Base Re-centering in the accused products are equivalent to the claimed "static" price axis.

In addition, all of the products can be configured by the user such that the Time Based Re-centering events will only occur until after a trading session is completed. Indeed, the predetermined, fixed time periods can be set to be as long as around 25 or 49 days in the GL products and 68 years in the FuturePath products. A9654, A9657-58, A9661. In such situations, the Time Based Re-centering event will never happen. Even if this Court agrees with the district court that such functionality, which will never occur, somehow avoids literal

infringement, the district court erred by taking the issue of the DOE away from the jury. When set up with time periods past a day, in reality the price axes of the accused products provide the benefit of the claimed invention and are not insubstantially different from “static.” A9654, A9657-59, A9661, A9664.

**C. The District Court Erred By Extending the Claim Vitiating Finding With Respect To Dual Dynamic in *eSpeed* To This Case**

The district court incorrectly applied the claim vitiating finding in *eSpeed* despite the key functionality differences between the accused products here and *eSpeed*’s Dual Dynamic. As set forth above, in the Dual Dynamic product, traders were always at risk of the occurrence of an automatic re-centering of price levels that could cause them to unexpectedly miss their intended price. This is because market conditions that were uncontrolled by the user could, at any time, cause the market indicators to reach the top or bottom of the display of prices and spontaneously trigger an automatic re-centering of price levels. A9405, A9408-10. Thus, the trader *never* received the benefit of the claimed invention. Accordingly, Judge Moran found that such functionality both altered the “efficacy of the product” and “frustrate[d] the stated purpose” of the claim term, “static.” A9409-10. Therefore, this Court affirmed a finding that reading the claims on Dual Dynamic vitiated “static.” *Trading Techs.*, 595 F.3d at 1356.

In contrast, the accused products here involve no such always-present risk. These products have predetermined, fixed time periods in which the user is

*guaranteed* that the price axis will not automatically move. A9655-57, A9663.

For the entirety of these predetermined, fixed time periods, the user is guaranteed of sending an order at his/her intended price. Because the user has this guarantee, the accused products do not frustrate the purpose of “static,” and provide the user the full benefit of the claimed invention. In addition, the only alleged automatic movement in the accused products is predictable and avoidable. The automatic movement in Dual Dynamic was never predictable and never avoidable.

Accordingly, this Court should reverse the district court’s grant of summary judgment of no infringement under the DOE based on claim vitiation.



## CONCLUSION AND RELIEF SOUGHT

The district court's rulings of summary judgment of no literal infringement and no infringement under the DOE are both based on mistakes of law and fact. At a minimum, there are genuine issues of material fact precluding a finding of summary judgment on both issues. Therefore, this Court should (1) reverse the district court's grant of summary judgment of non-infringement finding that "static" is not literally present in the accused products; (2) reverse the district court's grant of summary judgment of non-infringement finding that TT is barred from asserting the DOE due to claim vitiation; and (3) remand the case to the district court.

Respectfully submitted,

Date: September 4, 2015

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FORM 30. Certificate of Service

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FOR THE FEDERAL CIRCUIT

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### **CERTIFICATE OF COMPLIANCE**

I hereby certify that the foregoing Opening Brief of Plaintiff-Appellant Trading Technologies International, Inc. complies with the type-volume limitations of FED. R. APP. P. 32(a)(7)(B)(i) because it contains 13,890 words as measured by the word-processing software used to prepare this brief, excluding portions exempted from this requirement by FED. R. APP. P. 32(a)(7)(B)(iii) and FED. CIR. R. 32(b).

## **ADDENDUM**

**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION**

TRADING TECHNOLOGIES	)	
INTERNATIONAL, INC.,	)	
	)	
Plaintiff,	)	
	)	No. 05 C 4120
v.	)	
	)	Judge Sara L. Ellis
GL CONSULTANTS, INC., et al.,	)	
	)	
Defendants.	)	

**OPINION AND ORDER**

In this long-running patent dispute, Trading Technologies International, Inc. (“TT”) contends that Defendants SunGard Financial Systems (France) SAS, GL Trade Americas, Inc., SunGard Data Systems Inc., and SunGard Investment Ventures LLC (collectively, “GL Trade”), as well as Defendant FuturePath Trading LLC (“FuturePath”), have developed and sold electronic trading software products that infringe U.S. Patent No. 6,766,304 (the “’304 patent”) and U.S. Patent No. 6,772,132 (the “’132 patent”) (collectively, the “patents-in-suit”). As relevant to the present motions, TT alleges that GL Trade’s GL WIN electronic trading application with versions 5.9 and thereafter of the QuickTrade file/module infringe claims 1-3, 5-9, 11-14, 16-18, 20-23, 25, and 27-40 of the ’304 patent and claims 1-3, 7-10, 14-16, 20, 22-25, 27-30, 32-35, 37-40, 42-45, and 47-56 of the ’132 patent. TT also contends that all versions of FuturePath’s PhotonTrader 2 electronic trading application with the TradeMatrix file/module infringe claims 1-3, 5-9, 11-18, 20-23, and 26-40 of the ’304 patent and claims 1-3, 7-10, 14-16, 20, 22, 24-25, 27-30, 32, 34-35, 37-40, 42, 44-45, and 47-56 of the ’132 patent. Defendants have moved for summary judgment that these accused products do not infringe the patents-in-suit

because the claims' static limitation is not met. TT has filed a cross-motion for partial summary judgment that the accused products meet the static limitation. Because the Court finds that the accused products do not literally infringe and TT cannot take advantage of the doctrine of equivalents for all but a small number of the QuickTrade versions at issue, Defendants' motions [581, 610] are granted in part and denied in part and TT's motion [786] is denied.

## **BACKGROUND**

### **I. Patents-in-Suit**

The patents-in-suit relate to computer software used for electronic trading in the futures market. They disclose a static price axis and a dynamic display of bid and ask indicators. This combination was intended to ensure that a user can track changing market prices without the prices changing on him or her. With a static price level, the user will not enter an order at an unintended price.

The '132 patent has three independent claims: claims 1, 8, and 14. The '304 patent has two independent claims: claims 1 and 27. Claim 1 of each patent is the representative claim.

Claim 1 of the '132 patent states:

A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:

setting a preset parameter for the trade order

displaying market depth of the commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity, the dynamic display being aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

displaying an order entry region aligned with the static display prices comprising a plurality of areas for receiving commands

from the user input devices to send trade orders, each area corresponding to a price of the static display of prices; and

selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

'132 patent col. 12 ll. 1–27.

Claim 1 of the '304 patent states:

A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality



of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

'304 patent col. 12 ll. 35–col. 13 ll. 3. Each asserted claim of the '132 patent includes limitations containing the phrase “static display of prices.” Each asserted claim of the '304 patent includes limitations reciting a “static price axis” or a “common static price axis.” The difference in terminology in the '132 patent and '304 patent between the phrases “static display of prices” and “static price axis” is immaterial to the present motions.

## II. Claim Construction

In 2004 and 2005, TT filed a number of cases asserting infringement of the patents-in-suit. Those cases, including this one, were assigned to Judge Moran for all common issues related to discovery and claim construction. *See Trading Techs. Int'l, Inc. v. eSpeed, Inc. (TT Markman I)*, No. 04 C 5312, 2006 WL 3147697, at \*1 (N.D. Ill. Oct. 31, 2006). Judge Moran held a three-day *Markman* hearing and thereafter entered a claim construction order. The parties agree that Judge Moran's constructions govern the resolution of the present motions.

As relevant here, Judge Moran construed “common static price axis” as “a line comprising price levels that do not change positions unless a manual re-centering command is received and where the line of prices corresponds to at least one bid value and one ask value.” *Id.* at \*4. “Static display of prices” was construed as “a display of prices comprising price levels that do not change positions unless a manual re-centering command is received.” *Id.* In explaining his constructions, Judge Moran stated:

If “static” ordinarily means non-moving, then we cannot see how we can construe it any other way. The only exception can be the one explicitly stated in the specifications and prosecution history—movement due to receipt of a manual re-centering command. If we were to construe the term inclusive of additional unstated exceptions, such as automatic re-centering, we would not know where to stop. Defendant eSpeed aptly asks, “Why is a price display which automatically recenters after every two seconds

‘static,’ but a price display which automatically recenters after every five seconds is not? Why is a price display that automatically recenters when the inside market exceeds three ticks from the center price is ‘static,’ but a price display which automatically recenters after every fifth tick is not?” . . . Because we cannot say, we must construe the term “static” in its ordinary meaning, non-moving, and allow for the only exception plainly stated in the written description: manual re-centering.

*Id.* (citations omitted). Noting that the patents “were designed to achieve simultaneous goals: speed and accuracy,” Judge Moran found “that the purpose of the patents’ invention would be frustrated by the inclusion of any movement uncontrolled by the user.” *Id.* at \*5.

TT asked Judge Moran to clarify or reconsider the construction of the term “static.” *Trading Tech., Inc. v. eSpeed, Inc. (TT Markman II)*, No. 04 C 5312, 2007 WL 611258, at \*1 (N.D. Ill. Feb. 21, 2007). TT specifically sought clarification that the “claim element would be met ‘if the accused product ever embodies the claimed element, irrespective of how long it does so or whether such a product also has the capacity to act in an uncovered manner.’” *Id.* at \*2 (citation omitted). Judge Moran interpreted this part-time infringement theory to “seemingly suggest[ ] that the mere presence of a static price axis—regardless of whether it moves at some time—is still infringing.” *Id.* at \*3. He stated that in his view, “such an argument suggests that automatic re-centering takes an accused product or process out of the purview of plaintiff’s patent protection, but only for the split second that it is moving, so that the time when the accused product’s price axis is not moving, it is still infringing.” *Id.* Judge Moran noted, however, that “[a]ny movement takes a product or process outside the scope of plaintiff’s claim.” *Id.* at \*4. He clarified that, pursuant to his construction, “the price axis never changes positions unless by manual re-centering or re-positioning.” *Id.* Judge Moran acknowledged that a product that sometimes, although not always, embodies a claimed method infringes. *Id.* at \*5. Nonetheless, he emphasized that where “the claim limitation itself—here, a static condition—

requires permanency, any movement (outside of manual re-centering or re-positioning) negates one of the specified claim limitations. Therefore, introduction of such movement takes an accused device out of the protection of plaintiff's patents." *Id.*

### **III. Related Cases**

#### **A. *eSpeed***

After claim construction, the related cases proceeded separately. In *eSpeed*, Judge Moran granted summary judgment of non-infringement for the eSpeed defendants on two sets of products: Dual Dynamic and eSpeedometer. Dual Dynamic included both automatic and manual re-centering options. TT admitted that, under Judge Moran's construction of "static," Dual Dynamic did not literally infringe but argued that it did under the doctrine of equivalents. *See Trading Techs. Int'l, Inc. v. eSpeed, Inc. (eSpeed I)*, 507 F. Supp. 2d 854, 858–59 (N.D. Ill. 2007). eSpeedometer's re-centering feature was different in that "the price display automatically re-center[ed] the inside market in response to every change in the inside market by causing the inside market to gradually move back to the center of the screen," which the parties termed "drift re-centering." *Id.* at 858 n.1. TT argued that eSpeedometer infringed both literally and, alternatively, under the doctrine of equivalents. *Id.* at 859.

Judge Moran found that no eSpeed product that had automatic re-centering, including eSpeedometer, literally infringed TT's patents. *Id.* at 860. In discussing his construction of "static," Judge Moran reiterated that "a permanent state of lack of movement" is required, which eSpeedometer did not have. *Id.* Judge Moran also found that Dual Dynamic did not infringe under the doctrine of equivalents. *Id.* at 863–64. Although there was evidence that Dual Dynamic would automatically re-center only infrequently, Judge Moran concluded that "[a] finding that a change of positions (even once or twice per trading day) is equivalent to not

changing positions unless by manual re-centering would vitiate the ‘static’ requirement. The price levels either change positions . . . or do not change positions; there is no matter of degree.” *Id.* But he was not convinced that eSpeedometer did not infringe the static limitation under the doctrine of equivalents since eSpeedometer included a feature that “seemingly prevent[ed] trade commands from being entered at erroneous price levels.” *Id.* at 864–65. Judge Moran also found that TT was barred by prosecution history estoppel from arguing that eSpeedometer’s drift re-centering infringed on TT’s patents under the doctrine of equivalents. *Id.* at 866–67. This was because in amending its claims during the prosecution of the patents, TT added a clarification to what became claim 1 of each of the patents-in-suit that the “static display of prices does not move in response to a change in the inside market.” *Id.* at 866. But both of eSpeed’s products at issue, Dual Dynamic and eSpeedometer, included a price axis that moved in response to changes in the inside market. *Id.* Thus, TT could not argue they were equivalent. *Id.*

Judge Moran’s summary judgment order did not end the *eSpeed* case, however, as TT also claimed that eSpeed’s Futures View product infringed the patents-in-suit. Futures View was an eSpeed product sold before the patents-in-suit issued. *Trading Techs. Int’l, Inc. v. eSpeed, Inc. (eSpeed II)*, 595 F.3d 1340, 1348 (Fed. Cir. 2010). It allowed the user to turn off automatic re-centering, so that, if that user setting was selected, the price axis remained static unless manually re-centered. TT’s Futures View claims were tried to a jury over the course of four weeks. *Id.* at 1349. The jury found that Futures View infringed the patents-in-suit. *Id.* Judge Moran upheld the jury’s infringement verdict. *See Trading Techs. Int’l, Inc. v. eSpeed, Inc.*, No. 04 C 5312, Doc. 1140 (N.D. Ill. Jan. 3, 2008).

As relevant to the present motions, TT appealed Judge Moran's claim construction and finding that Dual Dynamic and eSpeedometer did not infringe its patents.<sup>1</sup> The Federal Circuit construed the claims *de novo* but agreed with Judge Moran's construction of the term "static." *eSpeed II*, 595 F.3d at 1352–55. It reiterated that "the 're-centering command' must indeed occur as a result of a manual entry." *Id.* at 1353. The Federal Circuit also stated that automatic re-centering "negates a claimed requirement that the price level remains static and does not move." *Id.* at 1354. Based on this construction, the Federal Circuit affirmed Judge Moran's finding that Dual Dynamic and eSpeedometer do not literally infringe the patents-in-suit. *Id.* at 1355. As for the doctrine of equivalents, the Federal Circuit observed that Dual Dynamic's "occasional automatic re-centering is not a 'subtle difference of degree' because the claim forbids all automatic re-centering." *Id.* at 1356. The Federal Circuit found the difference between a price axis moving only in response to a trader's instruction and one moving without prompting to "lie[ ] at the heart of the advantages of the patented invention over prior art." *Id.* Because Dual Dynamic "still present[ed] the potential problem of the prior art that allowed the inside market price to move while a trader was trying to secure a deal," the automatic re-centering feature was "substantially different" from the static limitation of the patents-in-suit and Dual Dynamic did not infringe under the doctrine of equivalents. *Id.* The court also found that TT "clearly surrendered a [graphical user interface] with price levels that move in response to inside market changes," barring TT from relying on the doctrine of equivalents to prove that eSpeedometer infringed the patents-in-suit because eSpeedometer's "price level automatically drifts towards the center of the display after every change in the inside market." *Id.* at 1357.

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<sup>1</sup> eSpeed did not appeal the jury's verdict that Futures View infringed the patents-in-suit.

**B. RCG**

In one of the related cases that had been coordinated before Judge Moran, Rosenthal Collins Group, Inc. (“RCG”) filed a declaratory judgment action against TT in anticipation of a patent infringement suit with respect to the patents-in-suit. *Rosenthal Collins Grp., LLC v. Trading Techs. Int’l, Inc. (RCG)*, No. 05-cv-4088, 2009 WL 3055381, at \*1 (N.D. Ill Sept. 18, 2009). RCG’s software, Onyx, included a window with a dynamic price axis that continually adjusted the prices displayed so the last traded price was always at the center of the column. *Id.* at \*2. If the cursor was positioned within the window, however, the price axis remained stationary. *Id.* at \*3. If the cursor was inactive for 30 seconds inside the window, the price axis would slowly readjust to bring the last traded price back to center. *Id.* Additionally, once the cursor was removed from the window, the price axis re-centered to the last traded price. *Id.* TT acknowledged that while the price axis was moving—when the cursor was outside the window or after the cursor was inactive within the window for over 30 seconds—Onyx did not infringe. *Id.* But it argued that while the price axis was not moving—when the cursor was positioned in the window—Onyx infringed its patents and thus, because the software could operate in an infringing mode, it infringed on the whole. *Id.* RCG argued that TT was trying to relitigate the part-time infringement argument it had lost before Judge Moran in *TT Markman II*. *See TT Markman II*, 2007 WL 611258, at \*3–5. Judge Dow rejected RCG’s argument, noting that TT was not claiming that Onyx’s price axis infringed because it remained stationary at some times and moved at others but rather that Onyx operated in different modes—one that infringed and one that did not and thus that the software as a whole infringed the patents-in-suit. *RCG*, 2009 WL 3055381, at \*3. As an example of such software, Judge Dow pointed to eSpeed’s Futures View, in which “the user may opt to have the price axis remain stationary by changing a menu

setting.” *Id.* Judge Dow ultimately found a question of fact as to infringement, noting that if TT’s argument that Onyx operated in three separate modes was correct, then Onyx operated like Futures View and infringed, but that if RCG was correct that Onyx had only one mode of operation in which there was always the possibility that the price axis would move without user input, then Onyx did not infringe. *Id.* at \*4. RCG and TT ultimately settled their claims.

*Rosenthal Collins Grp., LLC v. Trading Techs. Int’l, Inc.*, No. 05-cv-4088, Doc. 558 (N.D. Ill. Nov. 15, 2011).

**C. GL Trade Americas, Inc. v. TT (False Advertising Case)**

In 2011, GL Trade Americas, Inc. (“GL Trade Americas”) filed suit against TT, alleging that TT engaged in false advertising, unfair competition, and deceptive trade practices by misrepresenting the scope of the patents-in-suit. *GL Trade Ams., Inc. v. Trading Techs. Int’l, Inc.*, No. 11 C 1558, 2012 WL 205909, at \*1 (N.D. Ill. Jan. 23, 2012). Specifically, GL Trade Americas claimed that TT had marked certain of its software with the patent numbers for the ’132 and ’304 patents in a way that suggested that those patents covered products with automatic re-centering. *Id.* at \*2. The software at issue had two modes, a default that did not allow for automatic re-centering and an option that allowed for automatic re-centering. *Id.* The patent numbers were displayed on the screen at all times, even when automatic re-centering was enabled. *Id.* Judge Holderman dismissed GL Trade Americas’ complaint, finding that “in light of Judge Moran’s and Judge Dow’s rulings in the patent disputes, it was legally plausible for TT to believe that its products were covered by the ’132 and ’304 patents, and to mark them as such regardless of the products’ modes.” *Id.* at \*6.

**D. Open E Cry**

In a second round of litigation, TT filed twelve separate infringement actions against various defendants alleging infringement of over ten patents related to electronic trading software, including the patents-in-suit and other patents that have significant overlap with the patents-in-suit. *Trading Techs. Int'l, Inc. v. BGC Partners, Inc.*, No. 10 C 715, Doc. 70 (N.D. Ill. Feb. 3, 2011). Those cases were consolidated before Judge Kendall. *Id.* Judge Kendall entered partial summary judgment against TT, finding that certain claims of related patents were invalid for failure to comply with the written description requirement of 35 U.S.C. § 112 and that prosecution history estoppel barred TT from asserting U.S. Patent No. 7,685,055 against certain software products. *Trading Techs. Int'l, Inc. v. BCG Partners, Inc.*, 852 F. Supp. 2d 1027 (N.D. Ill. 2012). Judge Kendall's decision was premised on the Federal Circuit's decision in *eSpeed II*. *Id.* at 1044–48; *see also Trading Techs. Int'l, Inc. v. BCG Partners, Inc.*, 883 F. Supp. 2d 772, 778–79 (N.D. Ill. 2012) (denying TT's motion to reconsider and certifying partial judgment for immediate appeal). The Federal Circuit reversed, concluding that *eSpeed II* did not control, and remanded for further proceedings. *Trading Techs. Int'l, Inc. v. Open E Cry, LLC*, 728 F.3d 1309, 1319–23 (Fed. Cir. 2013). The consolidated cases remain pending before Judge Kendall.

**IV. Accused Products<sup>2</sup>**

GL Trade develops and sells market data and order execution software known as GL WIN. QuickTrade is a module that may be added to or included in GL WIN. QuickTrade generates and displays a graphical user interface that allows traders to view and enter orders

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<sup>2</sup> While the universe of accused products in this case is broader than those at issue in this Opinion, for ease of reference, the Court will refer to those products at issue in this Opinion collectively as the “accused products.”



electronically. Quick Trade versions 5.9 and after<sup>3</sup> include a feature that causes the price axis to re-center automatically at pre-set time intervals. When the QuickTrade module re-centers the price axis, the displayed market information is centered on the last traded price. The display can also move in response to a manual re-centering command. A change in the best bid and ask price and their respective quantities—also known as a change in the inside market—does not cause the price axis to re-center automatically.

QuickTrade's re-centering function is mandatory; it cannot be disabled by the user. But the user can adjust the frequency at which re-centering occurs. The default time for QuickTrade versions 5.9 to 5.13.5 is 10 seconds, while that for versions 7.1.1 and after is 900 seconds (or 15 minutes). The smallest value that the timer can be set for is 1 second, with the largest value ranging from version to version from 900 seconds to 99,999,999 seconds (slightly over 3 years).<sup>4</sup> In QuickTrade versions 10.1.1.7 and after, the user can display a countdown timer for the final 10 seconds before re-centering occurs. In these versions, the user can also disable the ability to enter an order for a period of 1 second before re-centering occurs.

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<sup>3</sup> The following versions of QuickTrade are at issue: 5.9.0, 5.10.0, 5.10.4, 5.10.5, 5.11, 5.11.1, 5.12.0, 5.12.1, 5.13, 5.13.2, 5.13.3, 5.13.5, 7.1.1, 7.1.2, 7.1.3.6, 7.1.4.4, 7.1.5.19, 7.1.5.29, 7.1.5.43, 8.0.2.32, 8.1.1.1, 8.1.1.8, 8.1.1.15, 8.1.2.12, 8.1.2.14, 8.1.3.6, 8.1.3.17, 8.1.3.19, 8.1.4.23, 8.1.5.7, 8.1.5.10, 8.1.6.12, 8.1.7.14, 8.1.7.18, 8.1.7.24, 8.1.9.6, 8.1.10.15, 8.1.11.87, 9.1.0.121, 9.1.1.9, 9.1.1.31, 9.1.2.17, 9.1.3.11, 9.1.4.7, 9.1.5.4, 9.1.6.6, 9.1.7.5, 9.1.8.16, 9.1.9.13, 9.1.10.3, 9.1.11.6, 9.1.12.5, 9.1.13.2, 9.1.13.3, 9.1.13.14, 9.1.20.9, 9.1.20.12, 9.1.20.17, 9.1.20.23, 9.1.20.24, 9.1.21.30, 9.1.21.35, 9.1.21.41, 9.1.21.55, 9.1.21.63, 9.1.21.71, 9.1.21.74, 9.1.21.77, 10.0.23.32, 10.0.23.66, 10.1.1.7, 10.1.1.15, 10.1.1.19, 10.1.1.23, 10.1.1.25, 10.1.1.33, 10.1.2.33, 10.1.2.46, 10.1.2.48, 10.1.2.52, 10.1.2.61, 10.1.2.70, 10.1.2.77, 10.1.2.83, 10.1.2.90, 10.1.2.95, 10.1.2.98, 10.1.2.105, 10.1.2.126, 10.1.2.162, 10.1.3.93, 10.1.3.97, 10.1.3.104, 10.1.3.114, 10.1.3.125, 10.1.3.132, 10.1.3.139, 10.1.3.146, 10.1.3.156, 10.1.3.175, and 10.1.4.107.

<sup>4</sup> Although some versions of QuickTrade will accept a number up to 99,999,999 seconds, those versions only accurately process a number less than or equal to  $(2^{31}-1)/1000$  seconds (about 24.8 days). Inputting a greater number will either cause the program to crash or will return a negative value that will cause the price axis to re-center as quickly as possible. TT maintains that all versions can be increased to extend the time period to  $(2^{32}-1)/1000$  seconds (about 49.7 days) or  $(2^{31}-1)/1000$  seconds (about 24.8 days) by using a text editor to modify a settings file in the user's application data directory. There is no evidence that this has ever been done by a trader, however.

Like GL Win, FuturePath's PhotonTrader 2 is market data software that displays real time financial market data and graphics and includes various independent modules. TradeMatrix is one of the independent modules operated within PhotonTrader 2. TradeMatrix generates and displays a user interface that allows traders to view and enter orders electronically. All commercially released versions of TradeMatrix<sup>5</sup> include automatic re-centering of the price axis at pre-set times. Automatic re-centering does not occur due to a change in the inside market. The price axis can also be re-centered manually.

As with QuickTrade, automatic re-centering is mandatory; it cannot be disabled. The default time interval for TradeMatrix versions 1.3.3.16 through 1.5.0.8 is 120 seconds, while that for versions 1.5.0.85 and thereafter is 20 seconds. The frequency at which re-centering occurs can be adjusted, with 1 second the smallest value for which the timer can be set and the largest value ranging from version to version. In earlier versions, the maximum value is  $2^{31}-1$  seconds (about 68 years), while in versions 1.5.0.85 and later, the maximum value is 60 seconds.<sup>6</sup> Unlike QuickTrade, the time between re-centering can be extended by mouse movement, which resets the timer. Mouse activity does not disable re-centering, however.

### LEGAL STANDARD

Summary judgment obviates the need for a trial where there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56. To determine whether a genuine issue of fact exists, the Court must pierce the pleadings and

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<sup>5</sup> The following versions of TradeMatrix are at issue: 1.3.3.16, 1.3.3.18, 1.3.3.26, 1.3.4.0, 1.3.4.2, 1.4.5.0, 1.4.5.3, 1.4.6.0, 1.4.7.0, 1.4.7.4, 1.4.7.6, 1.4.7.7, 1.4.7.9, 1.4.7.10, 1.4.7.11, 1.4.7.12, 1.4.7.13, 1.4.7.14, 1.4.7.15, 1.4.7.16, 1.4.8.0, 1.4.9.0, 1.4.9.2, 1.4.9.14, 1.5.0.0, 1.5.0.8, 1.5.0.25, 1.5.0.42, 1.5.0.50, 1.5.0.61, 1.5.0.62, 1.5.0.85, 1.5.1.0, 1.5.1.3, 1.5.1.14, 1.5.1.16, 1.5.1.20, 1.5.1.24, 1.5.1.26, 1.5.1.33, 1.5.1.34, 1.5.1.42, 1.6.0.1, 1.6.0.8, 1.8.0.1, 1.8.0.3, 1.8.0.23, 1.8.0.27, 1.8.0.36, 1.8.0.37, and 1.8.0.40.

<sup>6</sup> TT maintains that this can be increased to  $2^{31}-1$  seconds (about 68 years) by using a text editor to modify a settings file in the user's application data directory. There is no evidence that this has ever been done by a trader, however.

assess the proof as presented in depositions, answers to interrogatories, admissions, and affidavits that are part of the record. Fed. R. Civ. P. 56 & advisory committee's notes. The party seeking summary judgment bears the initial burden of proving that no genuine issue of material fact exists. *Celotex Corp. v. Catrett*, 477 U.S. 317, 323, 106 S. Ct. 2548, 91 L. Ed. 2d 265 (1986). In response, the non-moving party cannot rest on mere pleadings alone but must use the evidentiary tools listed above to identify specific material facts that demonstrate a genuine issue for trial. *Id.* at 324; *Insolia v. Philip Morris Inc.*, 216 F.3d 596, 598 (7th Cir. 2000). Although a bare contention that an issue of fact exists is insufficient to create a factual dispute, *Bellaver v. Quanex Corp.*, 200 F.3d 485, 492 (7th Cir. 2000), the Court must construe all facts in a light most favorable to the non-moving party and draw all reasonable inferences in that party's favor. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255, 106 S. Ct. 2505, 91 L. Ed. 2d 202 (1986). The same standard applies when considering cross-motions for summary judgment. *Int'l Bhd. of Elec. Workers, Local 176 v. Balmoral Racing Club, Inc.*, 293 F.3d 402, 404 (7th Cir. 2002). Therefore, when considering Defendants' motions for summary judgment, the Court views all evidence in the light most favorable to TT; and when considering TT's motion, the Court views all evidence in the light most favorable to Defendants. *See id.*

### ANALYSIS

To prove direct infringement, TT must establish by a preponderance of the evidence that the accused products infringe one or more claims of the patents-in-suit either literally or under the doctrine of equivalents. *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001). Determining whether a product infringes is a two-step process, with the Court first construing the scope and meaning of the claims at issue and then comparing the construed claims to the allegedly infringing product. *Cybor Corp. v. FAS Techs.*,

*Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998). Unless every limitation of a patent claim is found in the accused product, either literally or under the doctrine of equivalents, there is no infringement. *Deering Precision Instruments, L.L.C. v. Vector Distribution Sys., Inc.*, 347 F.3d 1314, 1324 (Fed. Cir. 2003). Infringement is generally a question of fact, but it may be determined on summary judgment “when no reasonable jury could find that every limitation recited in the properly construed claim either is or is not found in the accused device.” *V-Formation, Inc. v. Benetton Grp. SpA*, 401 F.3d 1307, 1310 (Fed. Cir. 2005) (quoting *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339 (Fed. Cir. 2001)).

The parties agree that Judge Moran’s claim construction of the static limitation controls. Thus, the Court need only consider whether the accused products meet the static limitation literally or under the doctrine of equivalents.

#### **I. Literal Infringement**

Defendants argue that the accused products do not meet the static limitation because they include an automatic re-centering feature that cannot be disabled. Specifically, Defendants maintain that because the accused products automatically re-center at specific time intervals without user input, TT cannot establish that the price axis re-centers only “as a result of a manual entry.” *eSpeed II*, 595 F.3d at 1353. They further argue that because automatic re-centering can never be disabled, the accused products never operate in an infringing mode during which the price axis remains static as required by the patents-in-suit.

TT, on the other hand, argues that the accused products have a mode in which the price levels do not move except by manual re-centering. Essentially, TT contends that the operation of the accused products can be broken into two different modes: (1) the instant when the price axis re-centers, which is pre-set to occur at specific time intervals; and (2) the time between automatic

re-centering, when the price axis will only move in response to user input. TT argues that the first mode is immaterial, for “an accused device may be found to infringe if it is reasonably capable of satisfying the claim limitations, even though it may also be capable of non-infringing modes of operation.” *Hilgraeve Corp. v. Symantec Corp.*, 265 F.3d 1336, 1343 (Fed. Cir. 2001). TT also argues that even if the accused products do not operate in separate modes, the movement of the accused products’ price axes is not automatic and thus can still be considered infringing.

The Court agrees with Defendants that no reasonable jury could find that the accused products literally meet the static limitation. TT’s argument that the accused products operate in separate modes is an improper attempt at an end-run around Judge Moran’s and the Federal Circuit’s construction of “static.” Static means “non-moving,” so that “[a]ny movement takes a product or process outside the scope of [TT]’s claim.” *TT Markman II*, 2007 WL 611258, at \*4 & n.5 (emphasis added). Here, the accused products include movement aside from manual re-centering. Thus, this movement takes the products outside the scope of the patents-in-suit, regardless of the fact that the price axis is static for a definable period of time. *Id.* at \*3, 5 (describing and rejecting TT’s part-time infringement theory).

Additionally, while the accused products are in use, there is no way for the user to operate them in solely an infringing mode. Although the user can control the period of time between automatic re-centering, automatic re-centering cannot be completely disabled and thus it is inevitable that the price axis will move without user input. Under Judge Moran’s construction, however, only the ability to disable automatic re-centering would bring the accused products within the static limitation. *See TT Markman I*, 2006 WL 3147697, at \*4. As Judge Moran noted in *TT Markman I*:

If we were to construe the term [“static”] inclusive of additional unstated exceptions, such as automatic re-centering, we would not

know where to stop. Defendant eSpeed aptly asks, “Why is a price display which automatically recenters after every two seconds ‘static,’ but a price display which automatically recenters after every five seconds is not? Why is a price display that automatically recenters when the inside market exceeds three ticks from the center price is ‘static,’ but a price display which automatically recenters after every fifth tick is not?” . . . Because we cannot say, we must construe the term “static” in its ordinary meaning, non-moving, and allow for the only exception plainly stated in the written description: manual re-centering.

*Id.* (citations omitted). TT argues that Judge Moran backed away from these statements in *TT Markman II* and that they only apply to TT’s proposed construction of static, which Judge Moran did not adopt. The Court disagrees; these statements indicate that the accused products, which provide for automatic re-centering at specific time intervals, do not meet the static limitation. *See TT Markman II*, 2007 WL 611258, at \*3 (rejecting TT’s part-time infringement theory, which, in Judge Moran’s view, “suggests that automatic re-centering takes an accused product or process out of the purview of plaintiff’s patent protection, but only for the split second that it is moving, so that the time when the accused product’s price axis is not moving, it is still infringing”); *id.* at \*5 (rejecting TT’s arguments “in support of its position that any period of a static condition falls within our construction of ‘common static price axis’ and ‘static display of prices’”).

TT’s request to separate the operation of the accused products into two modes is essentially an attempted end-run around the construction of the static limitation. Taken to its extreme, every product that includes automatic re-centering would be found to infringe under this theory because there would be at least a split-second when such re-centering was not occurring. TT suggests that its theory would not lead to such a result because those products that re-center in response to an inside market change always are at risk of moving whereas with the accused products that risk can be clearly separated out, making the static periods identifiable.

TT argues that Judge Moran and the Federal Circuit construed the static limitation to require products to re-center based on changes that occur randomly or unexpectedly, such as changes to the inside market price. *See, e.g.*, Doc. 787 at 20–22. It is true that eSpeed’s products re-centered based on changes to the inside market price, *eSpeed I*, 507 F. Supp. 2d at 858 n.1, 861, and that the accused products here do not. But neither Judge Moran nor the Federal Circuit built in a requirement that movement be in response to changes in the inside market or be otherwise unpredictable so as not to be considered static. *See TT Markman I*, 2006 WL 3147697, at \*4–5 (construing “static” as non-moving); *TT Markman II*, 2007 WL 611258, at \*4–5 (“[A]ny movement (outside of manual re-centering or re-positioning) negates one of the specified claim limitations.”); *eSpeed II*, 595 F.3d at 1353–54, 1356 (agreeing with Judge Moran’s construction of “static” and noting that “the claim forbids all automatic re-centering”). And while Judge Holderman described Judge Moran’s ruling as being “in essence . . . that TT’s patents did not cover automatic re-centering, that is, software in which the price levels automatically change positions when new data is received reflecting a change in the inside market,” *GL Trade*, 2012 WL 205909, at \*1, that is too narrow a reading of Judge Moran’s construction. Judge Moran placed no limitation on the reason for automatic re-centering in his construction of the static limitation, stating instead that “[a]ny movement takes a product or process outside the scope of plaintiff’s claim.” *TT Markman II*, 2007 WL 611258, at \*4 (emphasis added).

Taken to its logical conclusion, TT’s proposed mode argument would render even products like Dual Dynamic infringing, despite TT’s acknowledgment that Dual Dynamic did not literally infringe the patents-in-suit. But under the controlling construction, regardless of whether re-centering is based on a pre-set time interval (whether the program default or one of the user’s choosing) or a change in the market, the movement of the price axis is out of the user’s

control and thus automatic. *See id.* at \*2–5 (noting that the clarification order was intended to address whether the “static” term “requires a permanent state of lack of movement” and concluding that the claim limitation indeed “requires permanency” so that “any movement (outside of manual re-centering or re-positioning) negates one of the specified claim limitations”). Although the risk of missing a trade or trading at an unwanted price may be lessened where re-centering occurs at pre-set times because it is more “predictable,” TT cannot rewrite the claim construction to require automatic movement to be unpredictable to bring it outside the scope of the patents-in-suit.

Further, TT’s comparison of the accused products to eSpeed’s Futures View, which was found to infringe the patents-in-suit, is unavailing. While Futures View had a mode in which there was no possibility of automatic re-centering, the user had the ability to decide whether to enable or disable this mode. But here there is no setting that the user can elect to go from one mode to another; as already discussed, there is no separate mode where automatic re-centering can be turned off; the split-second during which automatic re-centering occurs cannot be separated from the remaining operation of the accused products. *See TT Markman II*, 2007 WL 611258, at \*3, 5 (rejecting TT’s part-time infringement theory that suggested that a product infringed for the time that the price axis did not move). TT argues that the differences between Futures View and the accused products are irrelevant to the question of whether there is a static mode, *see* Doc. 787 at 19 n.18, but its explanation undermines this contention. TT explains: “The two modes in the Futures View product were determined by a user setting, whereas in the accused products here the software switches the program from one mode to another.” *Id.* Thus, even as TT must acknowledge, the accused products’ re-centering is automatic—uncontrolled by the user—and thus cannot be considered a separate mode that the product enters for a split-



second so that the accused products have both an infringing and non-infringing mode. This stands in stark contrast to Futures View, where the user could choose based on a user setting whether to disable automatic re-centering.

Finally, TT argues that this Court should follow Judge Dow's opinion in *RCG*, where he denied summary judgment with respect to whether a similar product infringed the same patents-in-suit. *RCG*, 2009 WL 3055381, at \*3–4. TT claims that Judge Dow found that there was evidence that RCG's product had a static mode where there was no possibility of automatic movement. Doc. 787 at 3. But Judge Dow merely found that there was an issue of fact as to whether RCG's product operated in one mode or three modes, not that it definitively had a static mode, and thus left the infringement question to the jury's determination. *RCG*, 2009 WL 3055381, at \*4. As an initial matter, the Court is not bound by Judge Dow's opinion. But more importantly, the denial of summary judgment in *RCG* was fact-bound, dependent on whether RCG's product could "operate entirely in different modes—one that infringes and one that does not." *Id.* at \*3–4. RCG's product, according to TT, entered into a static mode when the user positioned the cursor within the window. *Id.* at \*3. But here, there is no suggestion that the user could take such action to create a separate mode in which the price axis would move only based on manual re-centering. Instead, the accused products operate in exactly the manner that Judge Dow described as non-infringing, with "a price axis that remains stationary only at certain times and moves at other times." *Id.* at \*3. Because the accused products include an automatic re-centering feature that cannot be disabled and thus can never operate in a mode where only manual re-centering is possible, the accused products do not literally infringe the patents-in-suit.

## II. Doctrine of Equivalents

Although the Court has concluded that the accused products do not directly infringe the patents-in-suit, it must still consider whether they infringe under the doctrine of equivalents. For an accused product to infringe under the doctrine of equivalents, “any differences between the claimed invention and the accused product must be insubstantial.” *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1346 (Fed. Cir. 2013). The doctrine of equivalents applies limitation by limitation, with the Court examining whether the accused product “performs substantially the same function in substantially the same way with substantially the same result as each claim limitation of the patented product.” *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1312 (Fed. Cir. 2009). Although infringement under the doctrine of equivalents is usually a factual question, where “the evidence is such that no reasonable jury could determine two elements to be equivalent,” summary judgment is proper. *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1356 (Fed. Cir. 2012) (quoting *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n.8, 117 S. Ct. 1040, 137 L. Ed. 2d 146 (1997)).

A patentee may be barred by prosecution history estoppel from asserting infringement under the doctrine of equivalents. *AquaTex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005). Prosecution history estoppel applies “when the [patentee] makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to the examiner.” *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005).

Defendants argue that TT cannot rely on the doctrine of equivalents to establish infringement. Defendants primarily rely on Judge Moran’s and the Federal Circuit’s findings

that Dual Dynamic did not infringe under the doctrine of equivalents and that TT was barred by prosecution history estoppel from arguing that eSpeedometer infringed under the doctrine of equivalents. TT, however, maintains that those findings were specific to the products at issue and cannot be applied to the accused products, which operate in a different manner.

The Federal Circuit considered whether Dual Dynamic's occasional automatic re-centering was equivalent to "never chang[ing] positions unless by manual re-centering or re-positioning." *eSpeed II*, 595 F.3d at 1356. Dual Dynamic "automatically and instantaneously re-center[ed] the price levels so as to move the inside market back to the field of the trader's view if the inside market shifted a pre-determined number of ticks from the center of the display." *Id.* at 1348. The Federal Circuit noted that Dual Dynamic's re-centering might only occur once or twice a day but found that "this occasional automatic re-centering is not a 'subtle difference of degree' because the claim forbids all automatic re-centering." *Id.* at 1356. The Court found the relevant difference not to be the frequency of the automatic re-centering but rather "the difference between a price axis that moves only in response to the trader's instruction and a price axis that adjusts itself without prompting." *Id.* Dual Dynamic's re-centering was found to pose the same problem as the prior art, which "allowed the inside market price to move while a trader was trying to secure a deal." *Id.* Thus, the Federal Circuit concluded that "Dual Dynamic's automatic re-centering feature is substantially different from the claimed invention and cannot fall within the scope of the claims under the doctrine of equivalents without doing violence to the 'static' claim element." *Id.*

The Federal Circuit did not consider whether eSpeedometer infringed under the doctrine of equivalents, instead examining whether TT was barred from making that argument by prosecution history estoppel. *Id.* at 1356–57. This was because Judge Moran found

eSpeedometer's drift re-centering did not vitiate the static limitation based on a feature that "seemingly prevent[ed] trade commands from being entered at erroneous price levels." *eSpeed I*, 507 F. Supp. 2d at 864–65. Dual Dynamic did not have this feature. *Id.* at 864.

Here, even though the accused products can be set to re-center only occasionally, as the Federal Circuit stated, the frequency of automatic re-centering is not the relevant comparison. *eSpeed II*, 595 F.3d at 1356. And while the price axis of the accused products does not automatically re-center in response to a change in the inside market, as Dual Dynamic did, this does not render the Federal Circuit's analysis inapplicable. As with Dual Dynamic, in all QuickTrade versions except versions 10.1.1.7 and thereafter,<sup>7</sup> users are always at risk of missing their intended price at the time that the automatic re-centering occurs. Thus, the automatic re-centering of the accused products (except QuickTrade versions 10.1.1.7 and after) presents essentially the same problem as Dual Dynamic did for TT—it defeats the claimed advantages of the patents-in-suit over the prior art—and thus TT cannot use the doctrine of equivalents to demonstrate that those versions do not infringe. *Id.*

This leaves QuickTrade versions 10.1.1.7 and after, which include an option by which the user cannot enter an order for a period of 1 second before automatic re-centering occurs. These versions appear similar to eSpeedometer as the option "seemingly prevents trade commands from being entered at erroneous price levels." *eSpeed I*, 507 F. Supp. 2d at 864. This option essentially keeps the price levels static at the time of re-centering so that the product could be found to be performing substantially the same function in substantially the same way with substantially the same result as the patented product. Defendants argue that the lock feature in QuickTrade versions 10.1.1.7 and after actually ensures that the trader's price is missed because

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<sup>7</sup> In QuickTrade versions 10.1.1.7 and after, the user can disable the ability to enter an order for a period of 1 second before automatic re-centering occurs.

a trader may want to enter a trade at a price but is prevented from doing so because entry is frozen for that second even though there is time to enter the order before re-centering occurs. Doc. 862 at 33 n.16. But Defendants do not address how freezing order entry for the second before automatic re-centering does not render the static limitation met under the doctrine of equivalents. The Court thus finds that there is at least a genuine dispute on the issue with respect to QuickTrade versions 10.1.1.7 and after.

TT would be precluded from arguing that these versions are infringing if prosecution history estoppel applies. Defendants argue that TT surrendered any subject matter that moves automatically during the prosecution of the patents-in-suit based on amendments it made to the claims that issued as claim 1 of each of the patents-in-suit. Both Judge Moran and the Federal Circuit examined this same argument with respect to Dual Dynamic and eSpeedometer and found that TT had “surrendered a [graphical user interface] with price levels that move in response to inside market changes.” *eSpeed II*, 595 F.3d at 1357; *eSpeed I*, 507 F. Supp. 2d at 866–67 (“TT has clearly disclaimed a price axis that moves in response to a change in the inside market.”). Defendants seize on language in the Federal Circuit’s opinion that “during prosecution, the inventors surrendered any subject matter that moves automatically.” *eSpeed II*, 595 F.3d at 1357. But the sentences before that statement demonstrate that the Federal Circuit’s finding on prosecution history estoppel was more limited:

[B]oth claim construction and prosecution history estoppel operate in this case with similar limited results. The first limits the claims to manual re-centering. The latter prevents TT from asserting that eSpeedometer is an equivalent, because its price level automatically drifts towards the center of the display after every change in the inside market.

*Id.* It is undisputed that the accused products do not automatically re-center in response to changes in the inside market. Defendants have not presented the Court with a basis to extend

prosecution history estoppel to every instance of automatic re-centering, nor is the Court able to discern such a basis. Thus, the Court finds that prosecution history estoppel does not bar TT from arguing that QuickTrade versions 10.1.1.7 and after infringe on the static limitation of the patents-in-suit under the doctrine of equivalents. TT may proceed on its infringement claims with respect to this limited subset of the accused products.

### CONCLUSION

For the foregoing reasons, Defendants' motions [581, 610] are granted in part and denied in part and TT's motion [786] is denied. QuickTrade versions 5.9.0 through 10.0.23.66 and all TradeMatrix versions discussed in this Opinion and Order do not infringe the patents-in-suit.

Dated: November 18, 2014

A handwritten signature in black ink, appearing to read 'S. L. Ellis', written over a horizontal line.

SARA L. ELLIS  
United States District Judge



US006766304B2

(12) **United States Patent**  
**Kemp, II et al.**

(10) **Patent No.:** **US 6,766,304 B2**  
(45) **Date of Patent:** **Jul. 20, 2004**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

5,774,877 A 6/1998 Patterson, Jr. et al.  
5,793,301 A 8/1998 Patterson, Jr. et al.

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(List continued on next page.)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 544 days.

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(51) **Int. Cl.** <sup>7</sup> ..... **G06F 17/60**

(52) **U.S. Cl.** ..... **705/37; 705/36; 705/35**

(58) **Field of Search** ..... **705/35, 36, 37; 345/814**

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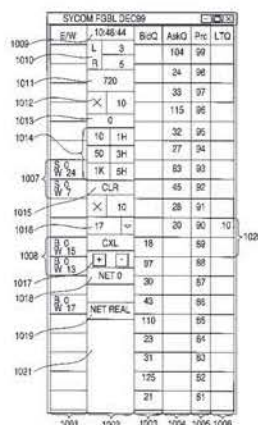
*Primary Examiner*—Richard Weisberger

(74) *Attorney, Agent, or Firm*—Foley & Lardner

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

**40 Claims, 6 Drawing Sheets**





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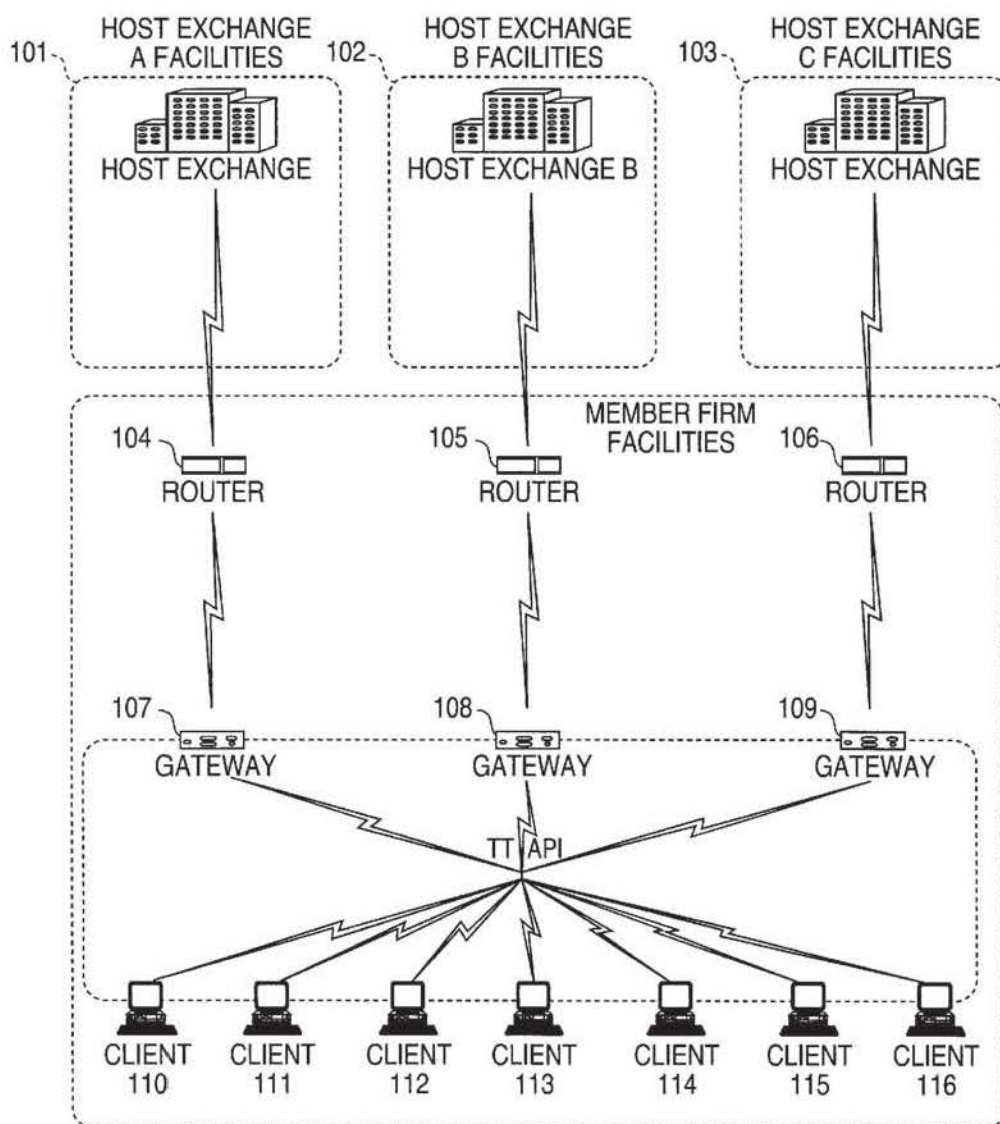
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



**FIG. 2**

		201	202	203	204	205			
	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99						
E/W		10:48:44	BidQ	AskQ	Prc	LTQ
1009	L	3		104	99	
1010	R	5		24	98	
1011	720			33	97	
1012	×	10		115	96	
1013	0			32	95	
1014	10	1H		27	94	
	50	3H		63	93	
1007	S 0 W 24	1K 5H		45	92	
	S 0 W 7	CLR		28	91	
1015	×	10		20	90	10
1016	17	▽		18	89	
1008	B 0 W 15	CXL		97	88	
	B 0 W 13	+ -		30	87	
1017	NET 0			43	86	
1018	B 0 W 17	NET REAL		110	85	
1019				23	84	
1021				31	83	
				125	82	
				21	81	

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**FIG. 4**

SYCOM FGBL DEC99								
E/W	10:48:44		BidQ	AskQ	Prc	LTQ		
	L	3		104	99			
	R	5		24	98			
	720			33	97			
	×	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93	10		
S 10 W 14	1K	5H		43	92			
	CLR		43		91			
	×	10	125		90			
	17	▼	97		89			
B 0 W 15	CXL		18		88			
B 0 W 13	+	-	97		87			
	NET 0		30		86			
B 0 W 17	NET REAL		43		85			
			110		84			
			23		83			
			31		82			
			125		81			
			21					

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FIG. 5

SYCOM FGBL DEC99								
E/W	10:48:44		BidQ	AskQ	Prc	LTQ		
	L	3		104	99			
1206	R	5		24	98			
1205	720			33	97			
	×	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93			
S 0 W 24	1K	5H		45	92			
S 0 W 7	CLR			28	91			
	×	10		20	90	10		
	17	▽		18	89			
1204	B 0 W 15	CXL	18		88			
	B 0 W 13	+ -	97		87			
	NET 0		30		86			
			43		85			
B 0 W 17	NET REAL		110		84			
			23		83			
			31		82			
			125		81			
			21					

1208

1201

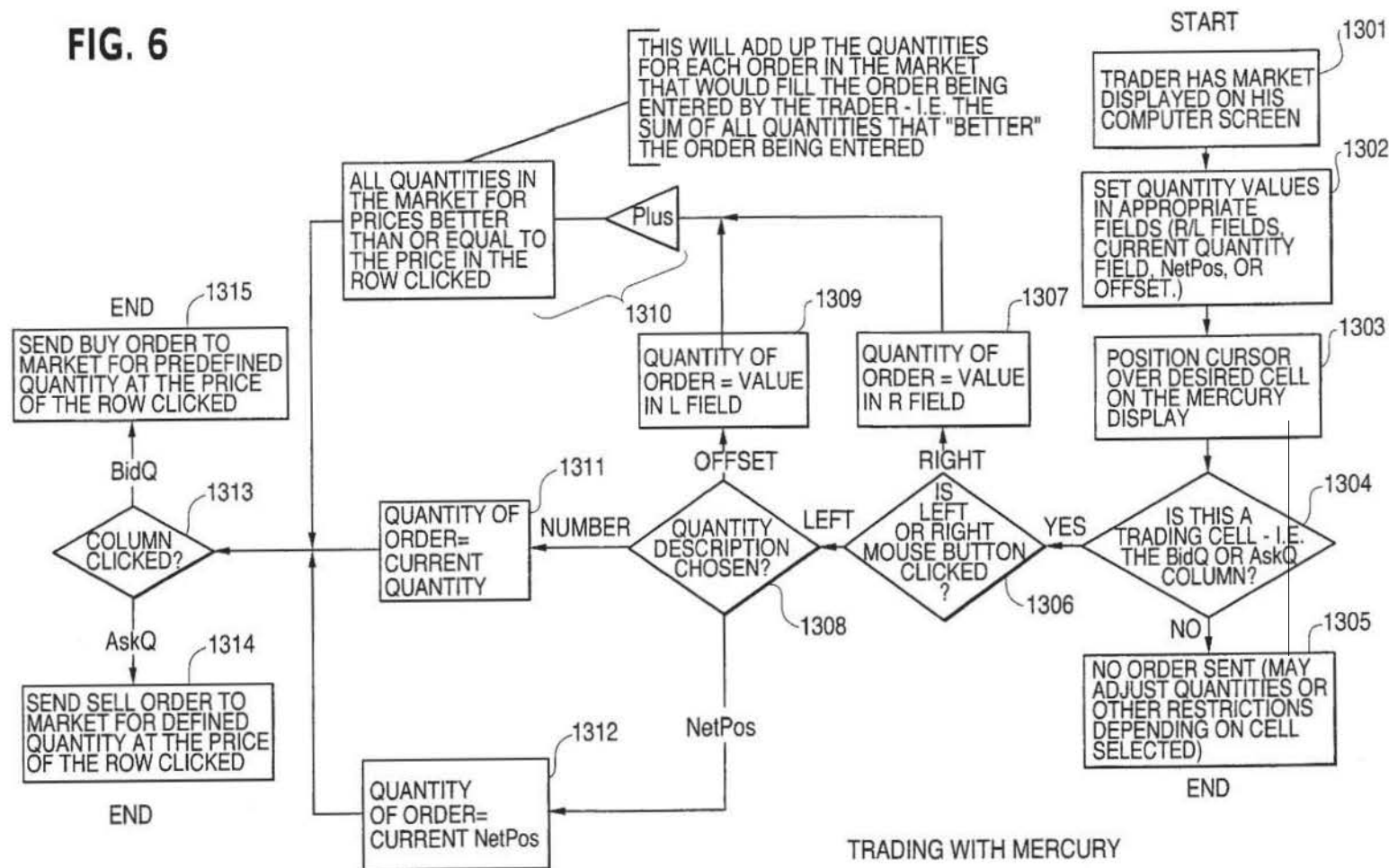
1202

1203

1207



FIG. 6



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**CLICK BASED TRADING WITH INTUITIVE  
GRID DISPLAY OF MARKET DEPTH**

This application is a divisional application of Ser. No. 09/590,692 filed Jun. 09, 2000 which claims benefit of 5 60/186,322, filed Mar. 2, 2000.

**PRIORITY**

The present application claims priority to a U.S. Provisional Patent Application entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

**FIELD OF INVENTION**

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade 20 orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

**BACKGROUND OF THE INVENTION**

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their

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screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.



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## SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

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In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow trader to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple



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algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also choose how far into the market depth to display on his screen. FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market-row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to

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receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity added at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of, the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

Abbreviations.			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Month	Expiration Month/Year	TheoBid	Theoretical Bid Price
Bid Mbr(1)	Bid Member ID	TheoAsk	Theoretical Ask Price
WkrBuys(2)	Working Buys for entire Group ID	Qact	Quote Action (Sends individual quotes)
BidQty	Bid Quantity	BQQ	Test Bid Quote Quantity
ThreshBid(6)	Threshold Bid Price	BQP	Test Bid Quote Price
BidPrc	Bid Price	Mkt BQQ	Market Bid Quote Quantity
Bid Qty Accum	Accumulated Bid Quantity	Mkt BQP	Market Bid Quote Price
BidPrc Avg	Bid Price Average	Quote	Checkbox activates/deactivates contract for quoting
AskPrc Avg	Ask Price Average	Mkt AQQ	Market Ask Quote Quantity
AskQty Accum	Accumulated Ask Quantity	Mkt AQP	Market Ask Quote Price
AskPrc	Ask Price	AQP	Ask Quote Price
ThreshAsk(6)	Threshold Ask Price	AQQ	Ask Quote Quantity
AskQty	Ask Quantity	Imp BidQty(5)	Implied Bid Quantity
WkrSells(2)	Working Sells for entire Group ID	Imp BidPrc(5)	Implied Bid Price
Ask Mbr(1)	Ask Member ID	Imp AskQty(5)	Implied Ask Quantity
NetPos	Net Position	Imp AskPrc(5)	Implied Ask Price
FFNetPos	Fast Fill Net Position	Gamma(3)	Change in Delta given 1 pt change in underlying
LastPrc	Last Price	Delta (3)	Change in price given 1 pt change in underlying
LastQty	Last Quantity	Vola (3)	Percent volatility
Total	Total Traded Quantity	Vega (3)	Price change given 1% change in Vola
High	High Price	Rhop (3)	Price change given 1% change in interest rate



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TABLE I-continued

Abbreviations.			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Low	Low Price	Theta(3)	Price change for every day that elapses
Open	Opening Price	Click Trd	Activate/deactivate click trading by contract
Close	Closing Price	S (Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Chng TheoPre	Last Price-Last Close Theoretical Price	Expiry	Expiration Month/Year

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As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column, does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the

Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, "10:48:44" in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell 1013 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "1H" will increase it by 100; "1K" will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 1010. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity



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(cell 1011) to zero. Cell 1019 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 10 11) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells 1101, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends, and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market, might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, 1021, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as -the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity,  $Q_a$ =Total of all quantities in AskQ column at an equal or better price than P,  $Q_b$ =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order—sent to market.

Apy order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

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If BidQ field clicked.

$$SO=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to buy 17 lots (quantity #chosen on the Quantity Description pull down menu cell 1204) of the commodity at a price of 89 (the corresponding price in the Prc column 1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to sell 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204



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will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column 1208 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step 1301, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step 1302, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step 1303, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step 1304, the system determines whether the cell clicked is a tradable cell (i.e. in the AskQ column or BidQ column). If not, then in step 1305, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 1306, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 1307, the system will use the quantity in the R field when it

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determines the total quantity of the order in step 1310. If the left button was clicked, then in step 1308, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step 1309, will use the quantity in the L field when it determines the total quantity of the order in step 1310. If NetPos was chosen, then the system, in step 1312, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 1311, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 1310, the system will determine that the total quantity for the trade order will be the value of the R field (if step 1307 was taken) or the value of the L field (if step 1309 was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in, the market that will fill the order being entered by the trader (plus the L or R value).

After either steps 1310, 1311 or 1312, the system, in step 1313, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 1314, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 1315, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input



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device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

2. The method of claim 1 wherein the bid and ask display regions and the order entry region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

3. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented vertically.

4. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented horizontally.

5. The method of claim 1 wherein one of the plurality of locations of bid display region comprises a blank region in which there is no first indicator displayed.

6. The method of claim 1 wherein one of the plurality of locations of the ask display region comprises a blank region in which there is no first indicator displayed.

7. The method of claim 1 comprising the step of displaying at least a portion of the common static price axis in a price display region.

8. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

9. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented vertically.

10. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented horizontally.

11. The method of claim 1 further comprising the steps of: dynamically displaying a third indicator at one of the plurality of locations in the bid display region, the third indicator representing quantity associated with at least one order to buy the commodity at a price different than the highest bid price currently available in the market; and

dynamically displaying a fourth indicator at one of the plurality of locations in the ask display region, the fourth indicator representing quantity associated with at least one order to sell the commodity at a price different than the lowest ask price currently available in the market.

12. The method of claim 11 wherein a location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.

13. The method of claim 1 wherein a location of the plurality of locations of the ask display region comprises a blank region in which there is no second or fourth indicator displayed.

14. The method of claim 1 wherein the order entry region comprises:

a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, each location corresponding to a price level along the common static price axis; and

an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, each location corresponding to a price level along the common static price axis.

15. The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.

16. The method of claim 1 further comprising dynamically displaying an entered order indicator in association with the price levels arranged along the common static price axis.

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17. The method of claim 16 wherein the entered order indicator is displayed in an entered order region.

18. The method of claim 1 further comprising dynamically displaying a last trade indicator in association with the common static price axis.

19. The method of claim 18 wherein the last trade indicator is displayed in a last trade region.

20. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

21. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

22. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the first indicator is displayed at a second location associated with the particular price level on the common static price axis.

23. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the second indicator is displayed at a second location associated with the particular price level on the common static price axis.

24. The method of claim 1 wherein the bid and ask display regions are displayed in different colors.

25. The method of claim 1 wherein the first and second indicators are displayed in different colors.

26. The method of claim 1 wherein the bid and ask display regions are displayed in a window further comprising centering the display of the first and second indicators in the window upon receipt of a centering instruction.

27. A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

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displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

**28.** The method of claim **11** wherein the first and third indicators are displayed in locations of the bid display region that are arranged along an axis which is parallel to the common static price axis.

**29.** The method of claim **11** wherein the second and fourth indicators are displayed in locations of the ask display region that are arranged along an axis which is parallel to the common static price axis.

**30.** The method of claim **11** comprising the steps of:

displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

**31.** The method of claim **30** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the first indicator is displayed at the second location.

**32.** The method of claim **31** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

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**33.** The method of claim **11** comprising the steps of:

displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

**34.** The method of claim **33** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the second indicator is displayed at the second location.

**35.** The method of claim **34** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

**36.** The method of claim **1** wherein the bid and ask display regions are displayed separately.

**37.** The method of claim **1** wherein the first and second indicators are based on an exchange order book and wherein the price levels along the common static price axis do not move in response to the addition of a price to the exchange order book, the additional price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

**38.** The method of claim **37** wherein the price levels along the common static price axis do not move in response to the removal of a price from the exchange order book, the removed price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

**39.** The method of claim **1** wherein the first and second indicators are based on an exchange order book and the price levels along the common static price axis never move in response to a price change in the exchange order book relating to a price which corresponds to a displayed location in at least one of the bid and ask display regions.

**40.** The method of claim **1** the plurality of parameters comprises a price and type of order.

\* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,766,304 B2  
DATED : July 20, 2004  
INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

Item [56], **References Cited**, U.S. PATENT DOCUMENTS, add the following:

-- 4,903,201	A	2/1990	Wagner
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FOREIGN PATENT DOCUMENTS, add the following:

-- WO WO 95/35005 9/1995 --

Column 14,

Line 64, the word "Static" should be -- static --.

Column 15,

Line 26, after "claim 11" add the word -- further --.

Column 16,

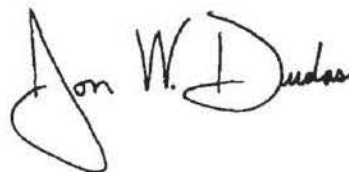
Line 1, after "claim 11" add the word -- further --.

Line 10, the word "an" should be -- and --.

Line 40, after "claim 1" add -- wherein --.

Signed and Sealed this

Sixteenth Day of November, 2004



JON W. DUDAS  
*Director of the United States Patent and Trademark Office*



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(12) **EX PARTE REEXAMINATION CERTIFICATE** (6739th)  
**United States Patent**  
**Kemp, II et al.** (10) **Number:** **US 6,766,304 C1**  
**(45) Certificate Issued:** **Mar. 31, 2009**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL  
 (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

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(73) Assignee: **Trading Technologies International, Inc.**, Evanston, IL (US)

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 Patent No.: **6,766,304**  
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 Appl. No.: **09/894,637**  
 Filed: **Jun. 27, 2001**

Certificate of Correction issued Nov. 16, 2004.

**Related U.S. Application Data**

(62) Division of application No. 09/590,692, filed on Jun. 9, 2000, now Pat. No. 6,772,132.  
 (60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.**  
**G06Q 40/00** (2006.01)  
**G06F 3/048** (2006.01)

(52) **U.S. Cl.** ..... **705/36 R; 705/35; 715/814**  
 (58) **Field of Classification Search** ..... None  
 See application file for complete search history.

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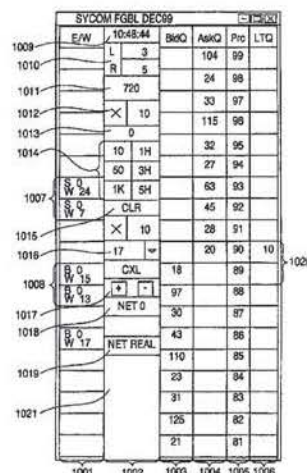
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*Primary Examiner*—Jeanne M. Clark

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.





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**EX PARTE  
REEXAMINATION CERTIFICATE  
ISSUED UNDER 35 U.S.C. 307**

NO AMENDMENTS HAVE BEEN MADE TO  
THE PATENT

2

AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

5

The patentability of claims 1-40 is confirmed.

\* \* \* \* \*



US006772132B1

(12) **United States Patent**  
**Kemp, II et al.**

(10) **Patent No.:** **US 6,772,132 B1**  
(45) **Date of Patent:** **Aug. 3, 2004**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(List continued on next page.)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 245 days.

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(21) Appl. No.: **09/590,692**

(22) Filed: **Jun. 9, 2000**

#### Related U.S. Application Data

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

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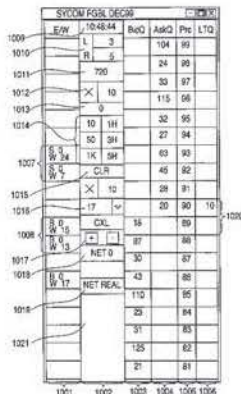
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#### ABSTRACT

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

**56 Claims, 6 Drawing Sheets**





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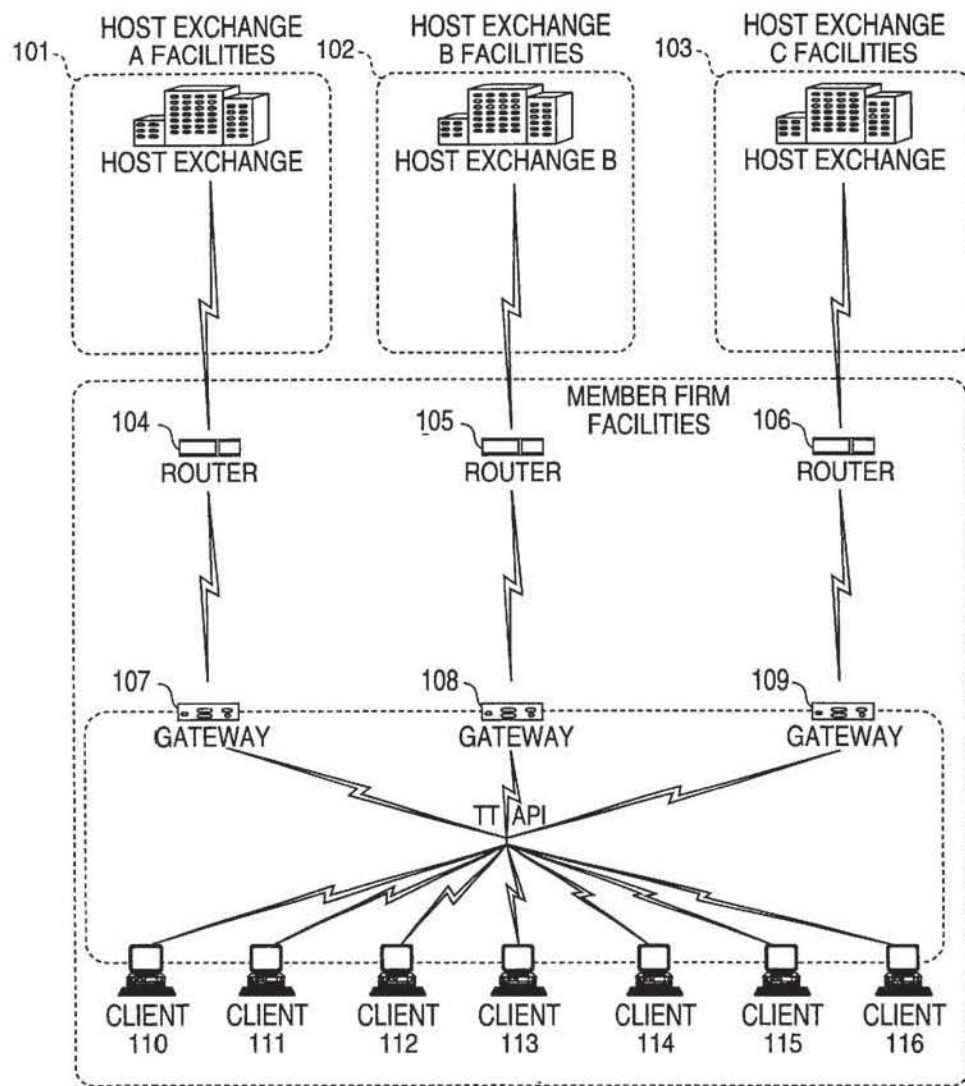
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**FIG. 1**

CONNECTION TO MULTIPLE EXCHANGES



**FIG. 2**

		201	202	203	204	205			
	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			



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FIG. 3

SYCOM FGBL DEC99						
E/W		10:48:44	BidQ	AskQ	Prc	LTQ
1009	L	3		104	99	
1010	R	5		24	98	
1011	720			33	97	
1012	×	10		115	96	
1013	0			32	95	
1014	10	1H		27	94	
	50	3H		63	93	
1007	S 0 W 24	1K 5H		45	92	
	S 0 W 7	CLR		28	91	
1015	×	10		20	90	10
1016	17	▽		18	89	
1008	B 0 W 15	CXL	18		88	
	B 0 W 13	+ -	97		87	
1017	NET 0		30		86	
1018	B 0 W 17	NET REAL	43		85	
1019			110		84	
			23		83	
1021			31		82	
			125		81	
			21			

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FIG. 4

SYCOM FGBL DEC99							
E/W	10:48:44		BidQ	AskQ	Prc	LTQ	
	L	3		104	99		
	R	5		24	98		
	720			33	97		
	×	10		115	96		
	0			32	95		
	10	1H		27	94		
	50	3H					
S 10 W 14	1K	5H		63	93	10	1101
	CLR		43		92		
	×	10	125		91		
	17	▼	97		90		
B 0 W 15	CXL		18		89		
B 0 W 13	+	-	97		88		
	NET 0		30		87		
			43		86		
B 0 W 17	NET REAL		110		85		
			23		84		
			31		83		
			125		82		
			21		81		

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FIG. 5

SYCOM FGBL DEC99						
E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	×	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	
S 0 W 24	1K	5H		45	92	
S 0 W 7	CLR			28	91	
	×	10		20	90	10
	17	▼		18	89	
B 0 W 15	CXL			97	88	
B 0 W 13	+	-		30	87	
	NET 0			43	86	
B 0 W 17	NET REAL			110	85	
				23	84	
				31	83	
				125	82	
				21	81	

1208

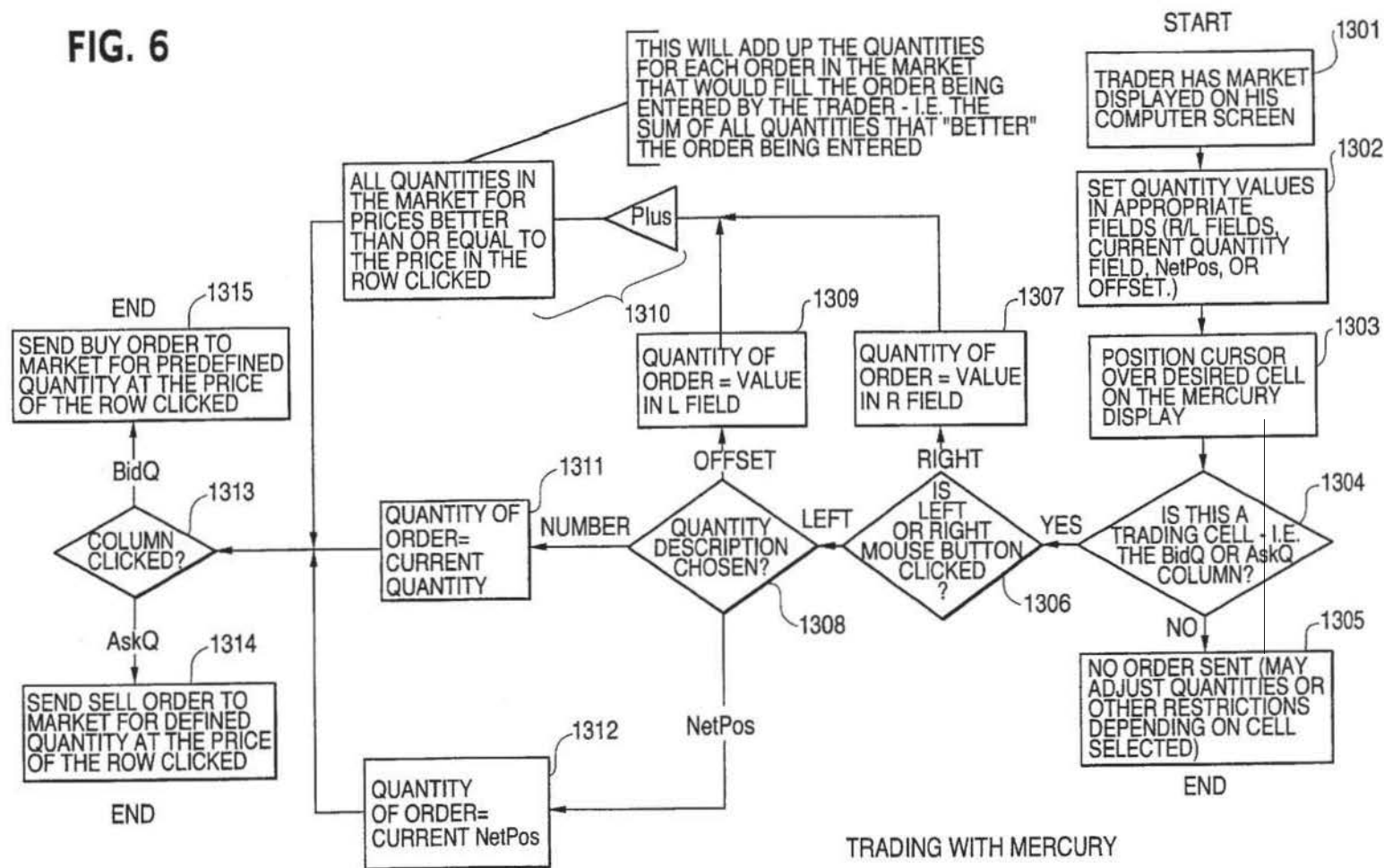
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FIG. 6





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**CLICK BASED TRADING WITH INTUITIVE  
GRID DISPLAY OF MARKET DEPTH****PRIORITY**

The present application claims priority to a U.S. Provisional Patent Application No. 60/186,322 entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

**FIELD OF INVENTION**

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

**BACKGROUND OF THE INVENTION**

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

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The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

**SUMMARY OF THE INVENTION**

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems



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and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive

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and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique



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known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays

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reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE 1

Abbreviations	
COLUMN	DESCRIPTION
Month	Expiration Month/Year
Bid Mbr <sub>(1)</sub>	Bid Member ID
WrkBuys <sub>(2)</sub>	Working Buys for entire Group ID
BidQty	Bid Quantity
ThrshBid <sub>(6)</sub>	Threshold Bid Price
BidPrc	Bid Price
Bid Qty Accum	Accumulated Bid Quantity
BidPrc Avg	Bid Price Average
AskPrc Avg	Ask Price Average
AskQty Accum	Accumulated Ask Quantity
AskPrc	Ask Price
ThrshAsk <sub>(6)</sub>	Threshold Ask Price
AskQty	Ask Quantity
WrkSells <sub>(2)</sub>	Working Sells for entire Group ID
Ask Mbr <sub>(1)</sub>	Ask Member ID
NetPos	Net Position
FFNetPos	Fast Fill Net Position
LastPrc	Last Price
LastQty	Last Quantity
Total	Total Traded Quantity
High	High Price
Low	Low Price
Open	Opening Price
Close	Closing Price
Chng	Last Price-Last Close
TheoPrc	Theoretical Price
TheoBid	Theoretical Bid Price
TheoAsk	Theoretical Ask Price
QAct	Quote Action (Sends individual quotes)
BQQ	Test Bid Quote Quantity
BQP	Test Bid Quote Price
Mkt BQQ	Market Bid Quote Quantity
Mkt BQP	Market Bid Quote Price
Quote	Checkbox activates/deactivates contract for quoting
Mkt AQQ	Market Ask Quote Quantity
Mkt AQP	Market Ask Quote Price
AQP	Ask Quote Price
AQQ	Ask Quote Quantity
Imp BidQty <sub>(5)</sub>	Implied Bid Quantity
Imp BidPrc <sub>(5)</sub>	Implied Bid Price
Imp AskQty <sub>(5)</sub>	Implied Ask Quantity
Imp AskPrc <sub>(5)</sub>	Implied Ask Price
Gamma <sub>(3)</sub>	Change in Delta given 1 pt change in underlying
Delta <sub>(3)</sub>	Change in price given 1 pt change in underlying
Vola <sub>(31)</sub>	Percent volatility
Vega <sub>(3)</sub>	Price change given 1% change in Vola
Rho <sub>(3)</sub>	Price change given 1% change in interest rate
Theta <sub>(3)</sub>	Price change for every day that elapses
Click Trd	Activate/deactivate click trading by contract
S(Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Expiry	Expiration Month/Year

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or



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horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column **1003** labeled BidQ and ask quantities are in column **1004** labeled AskQ. The representative ticks from prices for the given commodity are shown in column **1005**. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells **1020**, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column **1006** shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column **1001** labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells **1007**, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells **1008**, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of

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the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column **1002**. For example, "10:48:44" in cell **1009** shows the actual time of day. The L and R fields in cell **1010** indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell **1011**, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell **1012**, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell **1013** is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells **1014**. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "1H" will increase it by 100; "1K" will increase it by 1000. Cell **1015** is the Clear button; clicking this button will clear the Current Quantity field. Cell **1016** is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell **1010**. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell **1017** are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell **1018** is used to invoke Net 0; clicking this button will reset the Net Quantity (cell **1011**) to zero. Cell **1019** is used to invoke Net Real; clicking this button will reset the Net Quantity (cell **1011**) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells **1101**, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, **1021**, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to



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dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity,  $Q_a$ =Total of all quantities in AskQ column at an equal or better price than P,  $Q_b$ =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

If BidQ field clicked.

$$So=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu cell 1204) of the commodity at a price of 89 (the corresponding price in the Prc column

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1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204 will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the



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market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column **1208** will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step **1301**, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step **1302**, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step **1303**, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step **1304**, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step **1305**, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step **1306**, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step **1307**, the system will use the quantity in the R field when it determines the total quantity of the order in step **1310**. If the left button was clicked, then in step **1308**, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step **1309**, will use the quantity in the L field when it determines the total quantity of the order in step **1310**. If NetPos was chosen, then the system, in step **1312**, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step **1311**, the system will determine that the total quantity for the trade order will be the current quantity entered. In step **1310**, the system will determine that the total quantity for the trade order will be the value of the R field (if step **1307** was taken) or the value of the L field (if step **1309** was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps **1310**, **1311** or **1312**, the system, in step **1313**, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step **1314**, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step **1315**, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

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We claim:

1. A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:

setting a preset parameter for the trade order

displaying market depth of the commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity, the dynamic display being aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

displaying an order entry region aligned with the static display prices comprising a plurality of areas for receiving commands from the user input devices to send trade orders, each area corresponding to a price of the static display of prices; and

selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

2. A method of placing a trade order according to claim 1, wherein said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and wherein said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

3. A method of placing a trade order according to claim 2, wherein the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

4. A method of placing a trade order according to claim 2, wherein the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

5. A method of placing a trade order according to claim 2, wherein the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

6. A method of placing a trade order according to claim 2, wherein said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

7. A method of placing a trade order according to claim 2, further comprising canceling said trade order in response to a subsequent single action of the user input device.

8. A computer readable medium having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:

a first program code for setting a preset parameter for the trade order;

a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the



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commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and

a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

9. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 8, further comprising program code for establishing that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

10. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

11. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

12. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

13. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 12, further comprising program code for establishing that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

14. A client system for placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, the system comprising:

a parameter setting component for setting a preset parameter for the trade order;

a display device for displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move when the inside market changes,

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and for displaying an order entry region aligned with the static display of prices, comprising a plurality of areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices;

a user input device for positioning a pointer thereof over an area in the order entry region; and

a trade order sending component for receiving a command as a result of a selection of the area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

15. A client system for placing a trade order for a commodity according to claim 14, wherein said trade order sending component establishes that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

16. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

17. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

18. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a quantity equal to a predetermined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

19. A client system for placing a trade order for a commodity according to claim 18, wherein said trade order sending component establishes that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second predetermined value if a single action of a second type is taken.

20. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a vertical orientation.

21. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a horizontal orientation.

22. A method according to claim 1, wherein a plurality of said displayed bids and asks in the market include bid and ask quantities of the commodity.

23. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in different colors.

24. A method according to claim 1, further comprising re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction.

25. A method according to claim 1, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.



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26. A method of displaying according to claim 1, further comprising dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

27. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices in at least one direction in numerical order.

28. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices along a single line in numerical order.

29. A method of displaying according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

30. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented vertically.

31. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented horizontally.

32. A computer readable medium according to claim 8, further comprising program code to ensure that a plurality of bids and asks in the market include bid and ask quantities of the commodity.

33. A computer readable medium according to claim 8, further comprising program code to ensure that bids and asks are displayed in different colors.

34. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed prices corresponding to the bids and asks are re-centered about an inside market price upon receipt of a re-centering instruction.

35. A computer readable medium according to claim 8, further comprising program code for dynamically displaying working orders in alignment with the prices corresponding thereto.

36. A computer readable medium according to claim 8, further comprising program code for dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

37. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed in at least one direction in numerical order.

38. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed along a single line in numerical order.

39. A computer readable medium according to claim 8, further comprising program code for dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

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40. A client system according to claim 14, wherein said displays are oriented vertically.

41. A client system according to claim 14, wherein said displays are oriented horizontally.

42. A client system according to claim 14, wherein said displays of the pluralities of bids and asks in the market include bid and ask quantities of the commodity.

43. A client system according to claim 14, wherein said displays are displayed in different colors.

44. A client system according to claim 14, wherein said display of prices corresponding to the bids and asks is re-centered about an inside market price upon re-centering instruction from a user.

45. A client system according to claim 14, further comprising a display of working orders displayed in alignment with the prices corresponding thereto.

46. A client system according to claim 14, wherein said display device displays entered orders in alignment with the prices corresponding thereto and wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

47. A client system according to claim 14, wherein said static display of prices is displayed in at least one direction in numerical order.

48. A client system according to claim 14, wherein said static display of prices is displayed along a single line in numerical order.

49. A client system according to claim 14, wherein said display device displays a last traded quantity for said commodity in alignment with the price corresponding thereto.

50. The method of claim 2, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

51. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

52. A client system for placing a trade order for a commodity according to claim 15, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

53. The method of claim 1 wherein the market depth is based on an exchange order book and wherein the static display of prices does not move in response to the addition of a price to the exchange order book, the additional price comprising a displayed price.

54. The method of claim 53 wherein the static display of prices does not move in response to the removal of a price from the exchange order book, the removed price comprising a displayed price.

55. The method of claim 1 wherein the market depth is based on an exchange order book and the static display of prices never moves in response to a price change in the exchange order book relating to a price which is displayed.

56. The method of claim 1 wherein the plurality of additional parameters comprises a price and type of order.

\* \* \* \* \*

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,772,132 B1  
DATED : August 3, 2004  
INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

Item [56], **References Cited**, OTHER PUBLICATIONS, after the last entry, insert  
-- Patsystems News Release, PATSYSTEMS LAUNCHES J TRADER,  
November 06, 2001 --.

Column 9.

Line 65, delete "sell" and insert -- buy --.

Column 10.

Line 2, delete "buy" and insert -- sell --.

Signed and Sealed this

Second Day of August, 2005

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized, with a large, looped initial "J" and a cursive "Dudas".

JON W. DUDAS  
*Director of the United States Patent and Trademark Office*





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(12) **EX PARTE REEXAMINATION CERTIFICATE** (6740th)  
**United States Patent**  
**Kemp, II et al.** (10) **Number:** **US 6,772,132 C1**  
(45) **Certificate Issued:** **Mar. 31, 2009**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

2003/0097325 A1 5/2003 Friesen et al.

**FOREIGN PATENT DOCUMENTS**

(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL  
(US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

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(73) Assignee: **Trading Technologies International, Inc.**, Evanston, IL (US)

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**G06Q 40/00** (2006.01)  
**G06F 3/048** (2006.01)

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(58) **Field of Classification Search** ..... None  
See application file for complete search history.

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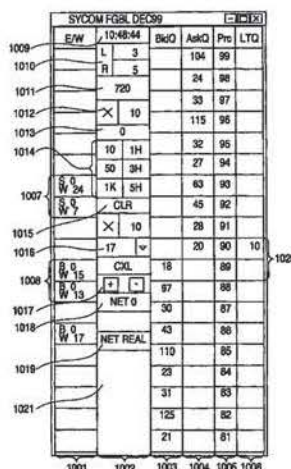
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*Primary Examiner*—Jeanne M. Clark

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.



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**1**

**EX PARTE  
REEXAMINATION CERTIFICATE  
ISSUED UNDER 35 U.S.C. 307**

NO AMENDMENTS HAVE BEEN MADE TO  
THE PATENT

**2**

AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

5

The patentability of claims 1-56 is confirmed.

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